UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

OHIO PUBLIC EMPLOYEES RETIREMENT SYSTEM, on behalf of Itself and All Others Similarly Situated,	)	**Case No. 4:08-cv-160**
	)	**Youngstown, Ohio**
Plaintiff,	)	**Friday, April 13, 2018**
	)	**10:04 a.m.**
vs.	)	
FEDERAL HOME LOAN MORTGAGE CORPORATION, aka Freddie Mac, et al.,	)	
Defendants.	)	

TRANSCRIPT OF PROCEEDINGS
BEFORE THE HONORABLE BENITA Y. PEARSON
UNITED STATES DISTRICT JUDGE

HEARING

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John J. Danish, Freddie Mac Party Representative

Steven P. Feinstein, Ph.D.

Mukesh Bajaj, Ph.D.

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P R O C E E D I N G S

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LAW CLERK: The matter on the docket this morning is Case Number 4:08-cv-160, Ohio Public Employees Retirement System versus Federal Home Loan Mortgage Corporation, and others.

THE COURT: Good morning, everyone. Thank you for standing. Feel free to retake your seats.

Let's start with the introductions. Plaintiff's counsel, if you would introduce yourself and those accompanying you, especially at counsel's table or other places in the courtroom.

MR. MARKOVITS: Yes, Your Honor. Bill Markovits on behalf of OPERS. Along with me is Rick Wayne from Strauss Troy on behalf of OPERS. To the right of Mr. Wayne is Kevin Lewis, who is our technical consultant. And then Professor Feinstein is in the courtroom with an associate of his. Rob Sparks of the Strauss Troy firm will also be joining us shortly. And there's a possibility that John Danish of the Ohio Attorney General's Office will be joining us shortly.

THE COURT: Thank you, Mr. Markovits. Welcome to you all.

MR. MARKOVITS: Thank you.

THE COURT: On behalf of the defense, will you

start with the introductions, those of you at counsel's table, and then seated behind you and other places in the courtroom.

MR. FRANK: Good morning, Your Honor. Jason Frank from Morgan, Lewis & Bockius on behalf of the corporate defendant, Freddie Mac. Along with me from Morgan Lewis are Emily Renshaw and Liza Hays. In addition, our co-counsel in the case is Hugh McKay. And along with us is also Dr. Mukesh Bajaj from Navigant Consulting who is in the courtroom. And finally, Your Honor, last but not least is Howard Lindenberg from the General Counsel's Office of Freddie Mac.

THE COURT: Welcome to you all. Thank you for the schedule that you collaborated on. It appears to be reasonable to me.

Before we start with the opening statement -- and it's suggested that Freddie Mac's opening statement will be first; that's what you've agreed to, Mr. Frank?

MR. FRANK: That's correct, Your Honor.

THE COURT: Before we start with opening statements, is there any reason that either side would ask for a separation of witnesses? We know in evidentiary hearings, rules of evidence are relaxed. But if there's a reason, of course I understand that what's been opined by Mr. Feinstein is already known to Mr. Bajaj -- and probably

I should be referring to you as doctor. I mean no offense by the reference I've used already. If there is a request for a separation, will you tell me now?

MR. FRANK: Your Honor, there's no request for sequestration of the witnesses. I believe they know each other's opinions.

MR. MARKOVITS: Yes, no requests on behalf of the plaintiffs, Your Honor.

THE COURT: Makes sense, then.

Then the member of the defense team making Freddie Mac's opening statement, are you ready?

MR. FRANK: I am, Your Honor.

THE COURT: Will you begin?

MR. FRANK: I will. Would you prefer that I speak at the podium?

THE COURT: I prefer you be wherever your voice can be picked up by the microphone and where you are most comfortable.

MR. FRANK: Well, I am comfortable in either place. Can I be picked up by the microphone here?

THE COURT: Mary?

THE REPORTER: Yes.

MR. FRANK: All right. Thank you.

THE COURT: All right, then.

MR. FRANK: Good morning, Your Honor. Thank you

for giving us the opportunity to present to you evidence bearing on Freddie Mac's Daubert motion. We believe that what you hear today will be crucial to your consideration of whether or not to exclude Dr. Feinstein, plaintiff's proposed expert, his testimony, and to strike his report, as well as your decision on OPERS' motion for class certification.

The parties have agreed to an order of presentation that you just referenced. As you'll see, Dr. Feinstein will testify first. He'll be called by counsel for plaintiff. And following his testimony, cross and redirect, we will be calling in rebuttal Dr. Bajaj, an expert retained by Freddie Mac.

Following the testimony that you hear from the two experts, Your Honor, we will be arguing the four motions: the motion to exclude Dr. Feinstein's testimony and strike his report; the motion to exclude Dr. Bajaj's testimony filed by OPERS; the motion to exclude Dr. Gompers' testimony, who isn't in the courtroom today; and finally, OPERS' motion for class certification at the end of the day.

Your Honor, before I talk about the evidence that I expect you will hear today, I am going to put that evidence in context by speaking briefly about market efficiency.

Freddie Mac has moved to exclude Dr. Feinstein's

opinion that Freddie Mac stock trades in an efficient market, as you know from the papers. Market efficiency is an economic theory. It is a creature of the science of economics.

10:08:49 In Basic v. Levinson, the Supreme Court was convinced by the science of economics that it could allow securities plaintiffs to be excused from an essential element of their claims. Usually in a fraud case, whether it's securities fraud or common law fraud, one of the 10:09:04 elements of the claim is reliance. Security plaintiffs no longer have to prove direct reliance on an allegedly fraudulent statement in certain circumstances.

In the Basic case, they held they could be excused from that element if a statement of material fact that is 10:09:25 false operates as a fraud on the market. Therefore, as long as a market is efficient, that is, that it consistently and promptly incorporates available information, including on those days when the allegedly material misstatement was made, then there's a sufficient connection between the 10:09:44 statement and the plaintiff's losses that plaintiffs can be excused from this essential element of their claims.

So instead of proving reliance, Your Honor, plaintiff has to prove market efficiency.

If a plaintiff can't prove market efficiency, then 10:09:59 it's got to prove direct reliance, and that is fatal to a

motion for class certification, because in such a case, the common issues would no longer predominate over individual issues as required by Rule 23(b)(3).

Now, the evidence that you're going to hear in the first half of the day, Your Honor, is as follows: OPERS has offered the testimony of Dr. Feinstein, an economist, on market efficiency. It is the only evidence they offer in support of their motion for class certification.

The evidence will show that Dr. Feinstein's testimony is exactly why the Daubert standards exist. The evidence will show that his approach here wasn't scientific, but rather, designed to serve his clients' needs.

The court will recall that the parties previously briefed class certification in the year 2012. The evidence will show that Dr. Feinstein, in connection with this current round of work on class certification, that he reviewed the prior experts' reports before he conducted any tests in this case.

In connection with its initial motion, Dr. Hallman submitted his report. He tested six earnings dates. You'll hear the phrase "earnings dates" used over the course of the day. We're referring to the public announcements by a public company, usually quarterly, as to its financial results.

Dr. Hallman tested six earnings dates. Now,

10:11:54 Dr. Feinstein knew that Hallman tested six earnings dates. He knew that Hallman concluded that only two of those dates were statistically significant. He knew that Dr. Bajaj criticized that work. He actually ended up agreeing with Dr. Bajaj's criticism, which established that only one out of six dates was statistically significant.

10:12:12 So then, after knowing all of that, what did Dr. Feinstein do in this case? He decided to run two tests. The first one was he decided he too was going to do an event study. But instead of testing six dates, he decided that he was going to test only one date. What's the one date he chose? He chose the one date that the prior experts had agreed had a statistically significant result, and he claimed that that supported his view that this market was

10:12:31 efficient.

10:12:48 What else did he do? Well, on that single date test, Your Honor, not only did he know that they agreed, he knew it was a date that the plaintiff had specifically chosen as the end of the class period. He knew it was a date with a huge stock price movement. He knew the results before he ever ran his test.

10:13:04 That's not good science. It doesn't matter what field of science you're in. We hypothesize and we test hypotheses. We don't know the results and then run a test that is simply going to confirm what we already know.

Then he ran a second test. His second test is called a Z-test. The evidence will show that Dr. Feinstein's Z-test is riddled with problems that justify exclusion of that testimony. It was based on insufficient data, the first prong of the Daubert test.

Even according to the very textbooks that Dr. Feinstein cites to support his Z-test, it violates sample size requirements. There are three sample size requirements in one of the textbooks that he cites. It's supposed to -- the test is supposed to satisfy all three requirements. It doesn't satisfy one of them.

This test, Your Honor, it doesn't even test market efficiency. It's not accepted as a reliable method by economists to test market efficiency.

The evidence will show that Dr. Feinstein made, actually made up approaches in this case that he has never used before, that no one has ever used before, just to avoid a negative result for his client.

The evidence will show that he deviated from standards that are set forth by the very economists on whom he relies. It will show that his approaches don't make logical sense.

The evidence will show that his opinions don't fail just one prong of the three prong reliability standard under Daubert, but all three: insufficient facts, not a

reliable method or principle, and a method or principle that's not even applied reliably.

What Dr. Feinstein does, Your Honor, is not good science. And under Daubert, he should never be allowed to present the opinions that he offers here to a jury. As a result, his testimony should be excluded, his report should be stricken, and at the end of the day, we'll be arguing that the motion for class certification should be denied.

Thank you, Your Honor.

THE COURT: Thank you, sir. May I ask this question? The schedule presented doesn't show that I should expect testimony from expert Gompers.

Is that true?

MR. FRANK: That is true, Your Honor.

THE COURT: Fair enough.

Thank you. The representative speaking for OPERS.

MR. MARKOVITS: Yes, Your Honor. Bill Markovits.

THE COURT: Good morning.

MR. MARKOVITS: Good morning, Your Honor. Bill Markovits on behalf of OPERS. It's a pleasure to be back in your courtroom, although, I have to say that I don't believe it's necessary for us to be here, and I'd like to spend a few minutes explaining why.

We're going to spend a lot of time today addressing issues that have no relevance and no impact on

the primary issue to be determined today, which is class certification.

On the facts that are either not disputed or can't reasonably be disputed, class certification is warranted. Now, we got a preview from Mr. Frank of the issues that he wants to discuss today. But I'd like to talk through what are the relevant issues today. Class certification, as Your Honor knows, has a number of requirements under Rules 23(a) and 23(b). Under Rule 23(a), the defendants do not dispute numerosity, commonality, typicality or adequacy of representation. So the 23(a) factors for class certification are not in dispute.

Under 23(b), they do not dispute superiority. The only class certification factors that they dispute -- the only class certification factor that they dispute is the 23(b) factor, predominance. And even on that one, they don't dispute that there are common issues of law in fact. They just focus on one issue, which is, as Mr. Frank said, the Basic presumption of reliance that allows -- the fraud-on-the-market theory that allows the class-wide reliance.

Now, courts throughout the country and within the circuit have set out a number of factors to use when determining whether there's an efficient market. Because in order to get a Basic presumption, as Mr. Frank said, you

have to prove that there's an efficient market. That's the burden on the plaintiff. The court set out a number of factors listed on this chart. There are five Cammer factors, three Krogman factors, and a number of courts will look at does the stock trade on a national exchange.

In this case, defendants don't dispute Cammer factors 1 through 4, they don't dispute any of the Krogman factors, they don't dispute that the Freddie Mac common stock traded on the New York Stock Exchange, which is a national exchange. The only factor they dispute is Cammer 5.

OPERS and its expert, Professor Feinstein, will show that Cammer 5, the empirical factor, is met in this case. But one of the reasons I made this chart is because if you take out the empirical factor, which is all the defendants want to discuss here today, if you take out that factor, market efficiency is still shown.

Courts throughout the country and within the Sixth Circuit say that the Cammer -- that the market efficiency can be determined on a combination of factors. Cammer 5 is not dispositive.

THE COURT: Does that mean, then, that OPERS concedes that the event study and the Z-test performed by Dr. Feinstein failed as alleged in the motion to strike?

MR. MARKOVITS: Absolutely not, Your Honor. As I

said, we will show that Cammer 5 is, in fact, met in this case. My point this morning is that even if it were not, even if we never even addressed Cammer 5, there's no question that market efficiency is shown.

10:19:44 THE COURT: I understand that answer, and I'll continue to listen throughout the day for a better discernment of an answer to my question, because I think the deposition of Dr. Feinstein says that he relied upon the event study and the Z-test in addition to those factors,

10:20:04 Cammer and Krogman factors.

But what I thought I've understood you to say is that if empirical factor, Cammer number 5, were not established, then you believe you still established market efficiency, correct so far?

10:20:19 MR. MARKOVITS: Absolutely.

THE COURT: What I also believe I understand at this early part of the hearing is that the event study and Z-test are attributed largely, meaning what you'd like me to consider as I consider your motion for class certification

10:20:30 comes primarily from Dr. Feinstein on those two points, event study and Z-test?

MR. MARKOVITS: No, Your Honor. That's what I would like -- the plaintiffs would like the court to consider for Cammer 5. Certainly that's the --

10:20:46 THE COURT: And then the question -- stay there.

Because the question is, for Cammer 5, that which you'd like me to consider comes from, as you have shown there, event study and Z-test, correct?

MR. MARKOVITS: Correct.

10:20:57 THE COURT: And if there were another chart, event study and Z-test evidence presented to the court, it's coming to me from Dr. Feinstein?

MR. MARKOVITS: That is correct.

THE COURT: All right, I'm with you.

10:21:11 Let me ask this of you: If your class isn't certified, the class suggested especially as indicated in your papers isn't certified, will OPERS persist with this case?

MR. MARKOVITS: I would have to consult with the

10:21:24 Attorney General's Office and with OPERS to determine that. Normally, if cases aren't certified, the case does not persist. But that would be up to the client.

THE COURT: Understood. Back to wherever you were, sir.

10:21:37 MR. MARKOVITS: Thank you.

The point with regard to Cammer 5 is Dr. Feinstein and the evidence itself clearly establishes undisputed factors relating to market efficiency, the first four Cammer factors, all the Krogman factors, and that the stock trades

10:21:57 on the national exchange.

Defendants would like to extract from that by focusing on the event study and the Z-test, and they concoct dozens, or more than a dozen reasons why those tests are supposedly insufficient. But that's only one part of the analysis, only one part of Dr. Feinstein's report and one part of the analysis. And, again, courts within the Sixth Circuit and around the country have said that the other factors are more than sufficient.

When you have -- when you have seven of the eight Cammer and Krogman factors with the stock trading on the national exchange, market efficiency is not even a close call. It should not be in dispute. Couple that with the fact that Dr. Bajaj did not make any effort to prove that the market was inefficient. He doesn't give an opinion that the market is inefficient, and he did no testing -- unlike in other cases he's been in, he did no testing in this case to show market inefficiency.

What defendants and Dr. Bajaj have asked this court is to adopt the position that this empirical factor, Cammer 5, is necessary and dispositive. No court, no court post-Halliburton II has said that; many courts have said that it is not. No court has said that it is. If this court were to adopt the position suggested by defendants, it would be the sole court in the country to do so.

Now, there's also an issue that's going to come up

today, I assume, with regard to price impact. Because once market efficiency is established, which we believe it clearly is in this case, under the Halliburton II case, the defendants have an opportunity to rebut the presumption of reliance by showing a lack of price impact.

10:23:58

In this case, though, as you'll see, they attempt to put the burden of showing price impact on plaintiff at class certification. That's not where the burden lies. The burden lies squarely on the defendant to show a lack of price impact.

10:24:16

And that burden, which has been called daunting by the courts and virtually irrebuttable by one of the Supreme Court justices, cannot be met by Dr. Bajaj simply saying, "I looked at the analyst report and I didn't see any connection." That cannot meet the burden. That's just pure ipse dixit. And as you know, we do have motions to exclude both Dr. Bajaj and Dr. Gompers for failure to follow the legal standards, which is a violation of Daubert.

10:24:38

And let's get to Dr. Gompers. You'll hear that defendants and their expert, Dr. Gompers, are also asking this court to adopt an interpretation of Comcast that has been rejected each of the 11 times that Dr. Gompers has raised it in post-Comcast cases. He's raised it 11 times; 11 courts have rejected it. It should be rejected here as well.

10:25:01

10:25:26

Defendants' arguments are Comcast requires Professor Feinstein to set out in detail his calculations. That's contrary to the standard practice in courts around the country, including within the Sixth Circuit, as we set forth in our papers.

This is a typical 10b securities case. Damages can be determined class-wide using the typical out-of-pocket damage methodology.

Let me get back for a second to my first point. We're going to be discussing a number of issues today, but I want to make sure that those issues don't distract from the main issue, which is should this class be certified. And applying the undisputed facts with the appropriate legal standards, we believe the answer is clearly yes.

Thank you.

THE COURT: Let me ask a question of you. And I'll also allow you to weigh in, Mr. Frank. There has been a discovery dispute ongoing. As you know, I referred it to Magistrate Judge Baughman.

I think I can read between the lines well enough to know that when a party files a motion for an oral argument, it's also sometimes just an attempt to tell the court, "Look, I'd really like to hear from you now, and if there's any other information the parties can give you by way of oral argument to help resolve that motion to compel,

we're here to do it."

Not having that answer yet from Judge Baughman about the discovery that defense provided to the SEC that apparently is in a format not understandable or readable by your client, what effect, if any, does it have on your ability to defend or prosecute the motions that are before us at this hearing today?

MR. MARKOVITS: That does not have an effect on the motions that are before us today. It will certainly have an effect going forward, because we have been hamstrung in discovery and we are trying to press forward as expeditiously as possible. We've had delays, and part of the delay is a result of the improper discovery or the discovery abuse that we believe took place with regard to the ESI.

But that substantive discovery should have no impact on the motions today.

THE COURT: Thank you, Mr. Markovits.

Mr. Frank, would you like to answer that question?

MR. FRANK: Your Honor, I agree with Mr. Markovits on this point and this point only. No. We agree on many things. But on this point, we also agree, Your Honor. We do not believe that the discovery issue impacts the four motions before the court today.

THE COURT: And this might be an

oversimplification, but my understanding of the unresolved issue before Judge Baughman, at least the largest one, is who will bear the cost of converting the electronically stored information into a format that's readable, understandable to plaintiffs.

10:28:33 Is that a fair summary?

MR. FRANK: Unfortunately, Your Honor, I think that the ESI issues are a little more complex than that. The plaintiffs had asked for the production we had made to the SEC many years ago. We provided that. They're unsatisfied with how easy it is to work with that and some of the metadata that is there and that isn't there.

10:28:45

So they've essentially asked for a reproduction of materials that would take a very long time, it would cost a lot of money, when, from our perspective, they have what they asked for and they have what they need and we've been proceeding.

10:29:07

THE COURT: Well, that doesn't sound all that different from what I was thinking, maybe from what I said. But what it means to me, Mr. Markovits, is what you have now or what the defense has intended to give you from the SEC is in a format that's unusable or not easily usable; is that fair?

10:29:18

MR. MARKOVITS: That's fair, Your Honor.

10:29:38 THE COURT: And what about the cost of making it

usable? Right now that's an issue before Judge Baughman, too, isn't it?

MR. FRANK: It is if you accept their position that it's unusable. We believe it's usable, that they have the documents that they need. They have a lot of metadata. We made a follow-up production --

THE COURT: And the estimate of what it would cost to put that in a format usable by plaintiffs is what?

MR. FRANK: I don't know if I have a current estimate now, but I don't think it would -- I think it's in the many millions. I don't know if it would exceed 10 million.

And I think that if -- and in terms of time, we're talking about six months to a year to make a reproduction.

THE COURT: We're talking about a 2008 case. I think the issue of time has flown by. All right. Thank you. You've helped me, you both have.

While this is still on Judge Baughman's docket, you know, at any time I could, of course, after consulting with him, make an adjustment.

And would just like you to know, defense counsel, I don't see it unreasonable if this case proceeds that you give the plaintiffs information that falls under appropriate discovery in a format that can be accessible even if you've already given it to a different party that had no problems

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10:31:16
10:31:31
10:31:47
10:32:01

with it.

So just study that for a while throughout the day, and at some point we hope that the docket will reflect that Judge Baughman will give you his ruling, and should you be dissatisfied with it, at least you know what my inclination at this point is.

MR. FRANK: We understand, Your Honor, and I appreciate it. If I could make one last point on that issue. I'd add that it is the defendants who filed the motion for oral argument. And I assure the court, it was not to prompt a ruling, it wasn't intended in that way at all, we just felt that there were issues in the reply brief that were not addressed, that it might be helpful if we addressed orally with the court, and we're still welcome to meet with the magistrate judge to discuss those issues.

THE COURT: Thank you for the clarification.

MR. FRANK: Thank you.

THE COURT: Next, examination of Dr. Feinstein. And after that, there will be cross-examination by -- I mean examination by OPERS, pardon me, then cross-examination by Freddie Mac. And then further examination, but only if there's time reserved before your 45-minute lunch break.

Do you care to make that reservation now?

MR. MARKOVITS: Yes, Your Honor. I'd just like -- I spoke with Mr. Frank and we both agreed if the court would

agree that I would just reserve -- as the day goes on, we'll just reserve the balance of any time not used in the initial presentation.

THE COURT: Except you will do the math.

10:32:16 MR. MARKOVITS: Fine, Your Honor.

THE COURT: All right. And I might confirm that the math is correct, but don't come back and say, "Oh, the time we didn't use," because in my mind you will have used it all.

10:32:27 MR. MARKOVITS: Okay.

THE COURT: Fair enough?

MR. MARKOVITS: Fair enough.

THE COURT: Okay.

MR. FRANK: Your Honor, we appreciate that. We

10:32:31 will do the math. And I just want to address one housekeeping issue regarding exhibits, if you wouldn't mind.

THE COURT: Certainly, please.

MR. FRANK: So the parties have agreed that for the purposes of this hearing and this hearing only, that the

10:32:45 exhibits that they've exchanged will be admissible and presumed authentic, and that there will not have to be efforts to offer exhibits that would otherwise slow down the proceedings.

THE COURT: Thank you for that.

10:33:00 Mr. Markovits, that matches your understanding?

MR. MARKOVITS: That does, Your Honor. And what we were planning to do also, again, if it meets with the court's approval, is mark the exhibits as we present them for the plaintiff as P1, 2, 3, 4 and on, and Mr. Frank intended to mark his D1, 2, 3, 4 and on.

THE COURT: Are they already marked or you intend to mark them as you use them?

MR. MARKOVITS: We're going to mark them as we use them.

THE COURT: Do you have what you need to do that?

MR. MARKOVITS: I have exhibit stickers and a pen. That's --

THE COURT: All right. Just do it expeditiously. We know the sequence now, P1, D something, 1 probably will be the first number. Thank you. And I apologize for any inconvenience our technology malfunction has on your presentation.

I've made a request that some help be brought to us today, ideally during the break. So we'll see what can be achieved. But I know that you understand the limitations and are prepared to work around them, right?

MR. MARKOVITS: Yes, Your Honor.

MR. FRANK: Yes, Your Honor.

THE COURT: Fair enough. Is there anything more before we call Dr. Feinstein?

MR. MARKOVITS: No, Your Honor.

THE COURT: Dr. Feinstein, will you please approach to be sworn? Sir, one moment. Step here. My law clerk will swear you in and then you'll go the direction you were headed.

10:34:26

STEVEN P. FEINSTEIN, Ph.D., of lawful age, a witness called by the Plaintiff, being first duly sworn, was examined and testified as follows:

THE COURT: Now, sir, if you will walk around; you were right, this is your seat. Make yourself comfortable in the witness stand. The water is fresh; if you'd like to pour some, you're welcome to it.

10:34:40

THE REPORTER: Judge, if you could ask everybody to speak up, the sound system is not working.

10:35:02

THE COURT: Mary, our court reporter, has just told me that one of our many failings today is that the sound system isn't working, so if you could please speak up.

THE WITNESS: Yes, Your Honor.

MR. MARKOVITS: May I proceed?

10:35:19

THE COURT: Yes.

MR. MARKOVITS: Thank you, Your Honor.

DIRECT EXAMINATION OF STEVEN P. FEINSTEIN, Ph.D.

BY MR. MARKOVITS:

Q. Good morning, Professor Feinstein. Would you please introduce yourself to the court?

10:35:24

A. Good morning, Your Honor. I'm Steven Feinstein.

Q. Professor Feinstein, what's your business address?

A. My business address is Crowninshield Financial Research, 56 Harvard Street, Brookline, Massachusetts 02445.

10:35:40 **Q.** What do you do for a living?

A. I'm an Associate Professor of Finance at Babson College. I've been there since 1996. In addition to that, I do a fair amount of consulting and I founded a consulting firm, which is my platform for financial analysis consulting.

10:35:55

Q. I know that defendants have not challenged your qualifications, but let me put up a slide and I'd like you very briefly to describe for the court your educational and work background.

10:36:06 MR. MARKOVITS: Slide 1, please.

BY MR. MARKOVITS:

Q. Can you see that, Professor Feinstein?

A. Not yet. No.

THE COURT: You're using your computer, aren't you, sir?

10:36:21

MR. LEWIS: Uh-huh.

THE COURT: Ralph, was this working earlier?

MR. MARKOVITS: Not working.

THE COURT: It should be on HDMI.

10:36:37 MR. LEWIS: It's coming.

MR. MARKOVITS: Is it going to take this long for it?

MR. LEWIS: No.

THE WITNESS: Okay, I have it.

10:36:48 BY MR. MARKOVITS:

Q. Okay. Could you briefly describe your educational and work background?

A. Sure. Educational background, I have a Bachelor's degree from Pomona College and a Master's M.Phil. and Ph.D. degrees in economics with a concentration in finance from Yale University.

In addition to the academic educational credentials, I also was awarded the Chartered Financial Analyst designation by the Chartered Financial Analyst Institute, which is the premier designation for practicing financial analysts.

So I have the academic credentials and a professional credential as well.

Q. And you've already mentioned a little bit about your teaching experience and business experience. If you could just state those briefly.

A. I'm a Tenured Associate Professor of Finance at Babson College. Prior to that I was at Boston University. In addition to my teaching and research and college responsibilities, I'm the Founder, President and Senior Expert at Crowninshield Financial Research. I've been

conducting financial analysis on a consulting basis for 22 years.

Q. And could you describe for the court the nature and purpose of your consultation in this case?

10:37:56 **A.** I was asked to examine the market for Freddie Mac stock, Freddie Mac stock itself, and make an assessment as to whether the stock traded in an efficient market over the course of the class period.

In addition to that, I was asked whether damages could 10:38:14 be calculated on a common basis using a common methodology for all proposed class members, where that methodology is consistent with the theory of liability of the plaintiffs.

Q. And did the nature of your engagement change at any point?

10:38:30 **A.** Yes.

Q. How?

A. Well, after I filed my opening report, there were two rebuttal reports, one from Professor Gompers and one from Dr. Bajaj. So I was asked to respond to those reports, read 10:38:42 what they said and assess if the arguments were valid and respond to those arguments.

But also in those reports, they raised the price impact argument, arguing that the alleged misrepresentations and omissions had zero impact whatsoever on the price of Freddie 10:38:58 Mac stock. So I was asked to analyze their argument and

their purported proof to see if it was valid.

MR. MARKOVITS: May I approach, Your Honor?

THE COURT: You may.

BY MR. MARKOVITS:

Q. Professor Feinstein, I'm showing you what's been marked as P1 for identification.

MR. MARKOVITS: Would you like a copy?

THE COURT: Thank you.

BY MR. MARKOVITS:

Q. Could you identify that for the court, please?

A. This is my report, the opening report on market efficiency, which also includes the Comcast analysis, the damage methodology analysis.

MR. MARKOVITS: May I approach, Your Honor?

THE COURT: You may.

BY MR. MARKOVITS:

Q. Professor Feinstein, I'm showing you what's been marked as P2. Could you identify that for the court, please?

A. This is my second report, the rebuttal report.

Q. You mentioned that you addressed market efficiency, class-wide damages and price impact. Do you believe that the work you've done could have been done by a layperson?

A. No.

Q. Do you feel that your testimony will aid the finder of fact to understanding the work you will present?

A. I do.

MR. MARKOVITS: And, Kevin, could you put up slide 2, please?

BY MR. MARKOVITS:

10:40:17 **Q.** Can you tell the court briefly what conclusions you've reached?

A. These are the conclusions on this slide. Freddie Mac stock did trade in an efficient market over the course of the class period. That's conclusion number one.

10:40:29 Damages in this matter can be computed for all class members using a common methodology that is consistent with plaintiff's allegations of liability.

And the third conclusion from the rebuttal report, defendants have not failed -- have not proved that the 10:40:44 misrepresentations and omissions had zero impact on Freddie Mac stock.

Q. I want to start off by talking to you about your market efficiency opinion. Could you explain to the court what's meant by "market efficiency"?

10:40:56 **A.** Right. And that's important. Market efficiency is the principle that the marketplace does not ignore material, relevant, important information; that information that's announced gets to the marketplace, it's disseminated through the marketplace; that traders and investors are able to 10:41:18 trade on that information; and therefore, that information

is reflected in the stock price.

So it's -- by contrast, an inefficient market would be one where there are impediments to information flow, there are impediments to trading so people can't trade on information even if they had it, or for irrational reasons, traders and investors simply ignored the information, or perhaps they believed the stock in the company are so small and so obscure that it's not worth their bother to analyze the information and trade on the information. That would make the market inefficient.

Q. Okay. What methodology did you use to determine whether the Freddie Mac stock traded in an efficient market during the class period?

A. I ran a battery of tests. And it wasn't just the Z-test and the event study. I ran the tests that were dictated by the Cammer and Unger factors. This is not a checklist of principles where each box has to be checked. The Cammer and Unger factors -- the Cammer and Krogman factors. Unger and Krogman are used interchangeably.

The Cammer and Krogman factors are each a test of market efficiency, and I ran the full battery of tests. I looked at trading volume; analyst coverage; the number of market makers; the fact that the stock was traded on the New York Stock Exchange; the principles underlying S-3 registration eligibility; market capitalization and flow

under Krogman, that's how big the company is, I assessed that and its implications for efficiency; I looked at the bid-ask spread, which is the measure of how costly it is to trade the stock, and I assessed the implications of that with respect to market efficiency.

I did all of those tests, and in addition, the empirical factor. The empirical factor as called for by the Cammer court, the Cammer court said it would be helpful that if in addition to these other tests, there were empirical demonstrations of the market actually behaving efficiently.

And so I ran standard tests -- the event study test and the Z-test is widely used now -- to assess whether they provide demonstrations of the market acting efficiently. And they do. And they do.

Q. And how often have you used that approach, that methodology to determine market efficiency?

A. Always. For 22 years, and dozens of cases.

MR. MARKOVITS: All right. Slide 3, please.

BY MR. MARKOVITS:

Q. Would you tell the court what this slide reflects?

A. This is a list of my market efficiency opinions over the course of my career.

Q. There's over 50 cases there. Did you use the same methodology, looking at the Cammer and Krogman factors and considering whether the stock traded on a national market,

in all those cases?

A. Yes. Every one of these cases I ran the battery of tests, the Cammer and Krogman factors, and an empirical test examining to see if there was an empirical demonstration of the stock behaving efficiently.

Q. To your knowledge, do other economists use the same methodology in securities cases when attempting to determine whether or not there's an efficient market?

A. They do.

Q. Does this methodology generally require subjective or objective determinations or both?

A. All analysis, all research has some elements of subjectivity. The analyst has to make choices about, for example, what data source to use. But for the most part, the Cammer and Krogman factors are very objective. The stock either trades actively or it doesn't. It's either a big company or it isn't. So there's usually not disagreement about whether those factors are satisfied in indicating market efficiency.

Q. And I know in this case there's not disagreement on many of the factors, but I'm still going to ask you to explain some of them or go over some of them with the court.

MR. MARKOVITS: Slide 4, please.

BY MR. MARKOVITS:

Q. Can you --

A. Okay.

Q. -- go through this? Yes.

A. Let me do this. Let me jump down to Krogman factor number 1, which is the fourth one down, the forth bullet point. That says Freddie Mac is a very big company.

Krogman factor 1 is market capitalization. That means, what is the total value of all the outstanding stock. It was $42.1 billion during the class period, placing Freddie Mac among the ten largest companies in the United States. This is not an obscure company flying under the radar.

So Krogman 1, market capitalization, $42.1 billion.

And going to the top. Trading volume, as you'd expect from a big company like that, is very active, 19.9 million shares traded per week. It's well above standards that are dictated in court cases as well as in the literature for what would define an efficient market.

Twenty-one professional analysts covered Freddie Mac. That is extensive, broad analyst coverage. That means that there are professionals whose job it was to receive the information, digest the information and publicize to the marketplace what this information means. So there were 21 analysts over the course of the class period.

616 major institutions, that's defined by the SEC as institutions that manage over a hundred million dollars of other people's money, owned Freddie Mac stock. Those major

institutions have their own analysts.

So there was plenty of professional analyst coverage making this market efficient.

Freddie Mac stock was listed on the New York Stock Exchange and had at least seven market makers facilitating the efficiency of that market. The New York Stock Exchange actually assigns a designated market maker, a specialist to each stock that's listed on their exchange to facilitate the trading and make sure it's an orderly market. So this is a probative factor for market efficiency as well as the other factors.

Krogman 2, the bid-ask spread, that along with Cammer 3 tells you that there were no impediments to trading the stock. Anyone who wanted to trade Freddie Mac stock could easily do so. So the thing that might make the market inefficient and inability to trade the stock did not apply to Freddie Mac. The average bid-ask spread was very narrow, which means that it was inexpensive to trade this stock.

And Krogman 3 is a different kind of size factor. It looks at market capitalization but then subtracts out how much of the stock is owned by insiders. Krogman 3 says that this stock was owned by the public, not by insiders, and it was very big. This stock was not being ignored by the marketplace.

MR. MARKOVITS: Okay. Slide 4, please.

MR. LEWIS: Slide 5 you mean?

MR. MARKOVITS: I'm sorry, slide 5.

BY MR. MARKOVITS:

Q. And you had skipped over the fourth Cammer factor, S-3, and that's reflected on this slide. Can you explain to the court your findings with regard to Cammer factor 4?

A. Well, okay. Cammer factor 4 as cited by the Cammer court and other courts, it's whether or not the stock is eligible for S-3 registration. And S-3 registration has requirements such as the size and trading volume and the filing of SEC-mandated reports.

So Freddie Mac stock was exempt from filing, but it satisfied the trading criteria and the size criteria, which are the criteria that the Cammer court said are the important ones that indicate market efficiency.

So Freddie Mac stock did satisfy Cammer 4. It satisfied the components of Cammer 4 that the Cammer court cited to are important.

Q. Professor, you used the term "probative" before. And you've addressed Cammer factors 1 through 4, Krogman factors 1 through 3. Are all of those probative of market efficiency?

A. Yes.

Q. Are they all supported by economic principles?

A. Yes.

Q. Do you need all of those factors to reach a finding of market efficiency?

A. Well, in the hypothetical, no. And in this particular case, they're all satisfied, so it's essentially moot. But, no, you don't. This is not a checklist where you have to check every box in order to conclude that the market is efficient. Each of these is a probative test of market efficiency.

Q. And how do you, as an economist, assess these factors?

A. Well, I look at them holistically. I look at them in the totality. And if all the factors point to market efficiency, I would conclude that the stock trades in an efficient market.

Q. And in this case, how did these factors support your finding that the market was efficient?

A. These factors are the reason for my conclusion that the market is efficient, and it wasn't even close. Freddie Mac is a big company. It's not obscure. There's no impediment to trading. There's no impediment to information flow. And there's demonstrations of it behaving efficiently. It wasn't even a close call.

Q. Now I want to turn to Cammer factor 5 and ask if you'd describe that factor for the court.

A. The Cammer court said it would be helpful if there was also a demonstration. And that's what Cammer 5 is. You

look at the stock price and observe, are there demonstrations of the stock responding to information; are there cases where there's indisputably important information that emerged about the company that according to valuation principles ought to move the stock price; and then you observe to see, did the stock price move or didn't it.

And that's what I did. That's the standard event study test. And I also did a collective event study test which provided additional demonstrations of empirical demonstrations of market efficiency.

Q. So both those tests support empirical factor, which is Cammer 5?

A. They do.

Q. Is Cammer 5 necessary for a determination of market efficiency?

A. No. No, not -- well, it depends exactly how you mean that. If you have all the other factors indicating market efficiency, then Cammer 5, it's icing on the cake; it's icing on the cake, but not necessary.

On the other hand, if you could have drawn or if you had conflicting information from the other factors, it would be more important. But when all the other factors point to market efficiency, then it's icing on the cake.

Q. So in this case, if you never even address Cammer factor 5, would that change your opinion that the Freddie

Mac stock traded in an efficient market?

A. It's hypothetical. I always try to do a comprehensive analysis. But if there was some reason that I couldn't do that analysis, it would not change my opinion.

10:52:01 **Q.** And you talked about an event study and a Z-test that you performed. Is an event study required in order to demonstrate Cammer factor 5?

A. Well, there are different kinds of demonstrations. There are different kinds of empirical tests that can be run. 10:52:18 So event study is the most common, but it's not always -- I wouldn't say it's required.

Q. Did you perform an event study in this case?

A. Yes.

MR. MARKOVITS: Slide 6, please.

10:52:35 BY MR. MARKOVITS:

Q. Can you describe for the court your event study?

A. Well, what an event study does -- and it's important that it be understood so it can't be distorted. What an event study does is it first requires the identification of events, 10:52:48 which based on the news, based on the news and based on valuation principles, should cause a large, a big movement in the stock price, either a big rise or a big fall. So it first requires identification of indisputably important news events that should move the market.

10:53:11 And then it examines, after factoring out, after

controlling for the marketplace and after controlling for a peer group, whether the stock, in fact, did move a large amount as it should, which would indicate that the market reacted to the information and didn't ignore that information.

Q. What did your event study in this case show?

A. Well, for a variety of reasons, I identified November 20th, 2007 as the ideal and most appropriate, in fact, only appropriate date to run the traditional event study. And I can explain why if necessary.

But it's indisputable that that was an important date. That the news on that date was important. That the news on that date was negative. That the news on that date, if the market was paying attention, should cause the price to fall. And, in fact, the price did fall 28.7 percent when Freddie Mac announced $2 billion of unexpected losses.

So that proves that this is an example, this is a demonstration that the market did not ignore information. This one demonstration proves that there were not impediments to information flow and that there was not impediments to trading. When this big news came out, the market reacted.

Q. Now, as you know and we've already heard this morning, defendants have criticized your use of a single date for the event study. Is there support for use of a single date?

A. Yes.

Q. Does your single date event study demonstrate market efficiency for the entire class period?

A. In isolation, I would say no. But in conjunction with the other Cammer and Krogman factors, then yes.

10:54:42

Q. Does --

A. Because the other Cammer and Krogman factors are observed throughout the class period, and this is a demonstration that the kind of impediments that might make the market inefficient did not bear on Freddie Mac stock.

10:54:55

Q. Does Dr. Bajaj indicate what he believes the required number of news days for such a study should be?

A. No.

Q. And you mentioned before, you talked about, I believe, strongly material news or indisputably material news. Let's start off with, what's "material news"?

10:55:14

A. Well, material news is the kind of information that investors consider in making investment decisions, deciding whether to buy or sell. It's also the information they would use in determining the correct valuation of the security.

10:55:31

Q. And why wouldn't you just look for material news when you're looking for event dates?

A. Because not all material news would have a correct efficient market impact on the stock price -- okay. Let me

10:55:47

say it a different way. Not all material news is going to be so important that it should, according to valuation principles, move the stock price so much that it will appear to be statistically significant.

Some material news might have -- it will be material, but it should have a modest impact on the stock price, according to the correct valuation principles. If it has a modest impact, it will appear to be not significant and the test will be indeterminate. You won't know whether it was a non-significant -- a non-statistically significant movement because people ignore the news or because they didn't ignore the news and the correct movement was a modest change.

So it's important to do -- when you're doing the market efficiency event study, to pick only the most impactful kind of news and events.

Q. Are there articles or literature that give examples of cases where you have clearly material news, terms that a reasonable investor would be interested in that news, but it doesn't have a statistically significant price reaction?

A. Yes. There's an article that's being -- that's widely circulated, widely respected by Brav and Heaton. Brav and Heaton point out, they use an example that sounds a lot like Freddie Mac. They say it's a $42 million [sic] company in their example.

Q. 42 billion would that be?

A. I'm sorry?
Q. 42 billion?
A. 42 billion. I meant billion, yeah.
Q. Yeah.
10:57:11 **A.** 42 billion. They say it's a $42 billion company and the company announces a $700 million loss. Well, if you take the percentage of $700 million versus 42 billion, clearly it's economically material. Clearly people are going to care about 700 million. But the percentage change 10:57:29 in the stock price when you calculate the percentage of what 700 million is of 42 billion, it will not -- it won't be over the threshold for statistical significance.

So there's a difference recognized in the literature between economic materiality and statistical significance.
10:57:44 **Q.** And --
A. And also --
Q. I'm sorry, go ahead.
A. -- the other kinds of news that could cause a -- the other kind of conditions that might make material news not 10:57:53 cause a statistically significant change in an efficient market is when the news is expected, in line with prior expectations, so that the news maintains the price where it used to be.

Or news that comes out in a -- simultaneously, if it's 10:58:11 positive news, it comes out with negative news, confounded

or conflicted news, mixed news, if the news is mixed, it might be very material, but it won't have a significant, a statistically significant impact on the stock price. It's a very common situation.

Q. And that gets to a follow-up question. Can you explain, would a material misrepresentation necessarily cause a stock price to increase, decrease or stay the same, or all of the above?

A. All of the above. The answer is all of the above, because there could be a material misrepresentation that maintains market -- the market's understanding of the company at its old perception, when, in fact, the company has become worse off.

So the reaction to a confirmatory or the kind of misrepresentation that buoys the stock price would be that the stock price is buoyed and doesn't fall. So the impact of a material misrepresentation could be that it holds the stock price the same and prevents it from falling.

Q. You've reviewed the report of Dr. Bajaj and his deposition?

A. I did read those.

Q. Does he make any claim regarding the percentage of material news days that in his view should be expected to have a statistically significant stock price reaction?

A. Yeah. He was flat-out wrong. He said 80 to 90

percent. And the literature is clear that not all material news will cause a statistically significant reaction. But he said 80 to 90 percent.

Q. If you had to prove market efficiency, you had to show a statistically significant stock price reaction to 80 to 90 percent of material news days, what would be the result?

A. Well, there's literature on that, too. Most stocks would fail. Most stocks that are even generally understood to be the most efficient would fail that test.

Q. So based on what you reviewed, do you have an understanding of how Dr. Bajaj can claim that 80-90 -- 80 to 90 percent of material news days should have this statistically significant stock price reaction?

A. Well, I read his report and I read his deposition and it seemed he tried to rehabilitate that opinion, which is clearly wrong, by redefining material in a circular way. He said that it's material if it causes a significant reaction.

Well, if you define material to be that it causes a significant reaction, then you'll have 100 percent. He redefined it with circularity to meet his prior testimony.

Q. All right. You've talked about the event study. I want to talk about the collective test you ran.

MR. MARKOVITS: If you could put up slide 7, please.

BY MR. MARKOVITS:

Q. First of all, what's a "collective test"?

A. A collective test is a different kind of event study, where instead of examining whether a momentous event causes a significant change in the stock price, what it does is it looks at -- it first selects dates, a group of dates on which there is an elevated flow of information, on which there are things happening with the company or news coming out about the company so that there's an elevated flow of information.

And then it compares the stock price dynamics in the news group to the stock price dynamics -- stock price dynamics in the non-news group. If there's a significant difference between the two, it proves that information matters and that the marketplace is not ignoring information, which is market efficiency.

Q. What collective test did you run?

A. It's described on this slide here. I used a screen where if an event was reported by The Wall Street Journal and The New York Times, it satisfied the screen. And I used that screen because I knew that it's contentious and it would be challenged, whether I was being subjective in the choice of events. So I delegated that decision of event choice to the editors of The Wall Street Journal and The New York Times. It's their job to determine what is news and what isn't.

So I identified these nine company events and then --

Q. Can I stop you? I'm sorry. Can I stop you right there, Professor?

A. All right.

Q. Is there support for your use of The Wall Street Journal and The New York Times?

A. Yes. I mean, I would love to say that I invented and claim this methodology, I would love to say that I can claim credit for this methodology, but I can't. It's in the literature; it's widely used.

Q. I'm sorry, I interrupted you. Go ahead.

A. Well, then, so the nine dates, because they're elevated news dates and there's no screen to see if these are the kind of dates that should cause a significant reaction, you would -- not all of them need to cause a reaction.

What would indicate market efficiency is if there was a higher incidence of statistical significance within the news group as opposed to the non-news group.

And in this case, that's what happened. 44.4 percent of the news events were statistically significant. And only 5.9 of non-news events were statistically significant.

Well, I didn't stop there. We all can see that 44.4 percent is bigger than 5.9 percent. But statistics requires a test to determine whether it's a meaningful difference and a difference that couldn't happen by random chance alone.

And that's where the Z-test comes in. The Z-test is the underlying statistical engine of the collective test. It's the Z-test that determines that 44.4 is, in fact, bigger than 5.9.

11:03:34 And since the Z-test and confirmatory diagnostic tests prove that the news events had different price dynamics than the non-news events, I reached the conclusion that Freddie Mac stock here empirically demonstrated market efficiency again.

11:03:51 **Q.** Does use of the Z-test methodology for examining incidence rates have support in peer-reviewed articles?

A. Yes.

Q. Have you used the Z-test before in assessing Cammer factor 5?

11:04:04 **A.** I have. Three cases that come to mind are the Marvell Technologies case, Petrobras and ARCP, it's American Realty Capital Properties, all used the Z-test.

Q. Now, there's been a question raised about this, so let me ask: Was your sample size sufficient?

11:04:22 **A.** Yes, the sample size was sufficient. The challenge that it was insufficient is just wrong. The literature says that with small sample, there may be small sample problems, but -- and it also shows how to deal with the small sample problems. So it's not always a problem.

11:04:41 And the way you deal with the small sample problems are

11:04:54 11:05:09 11:05:24 11:05:40 11:05:50

to check to see if, in fact, it's a valid criticism, is with diagnostic tests. I ran a battery of diagnostic tests. This Z-test passes.

Q. All right. Let's get to that.

MR. MARKOVITS: Slide 8, Kevin.

BY MR. MARKOVITS:

Q. Does this describe the three diagnostic tests you ran?

A. It does, Fisher's exact test, the Bootstrap test and the Binomial test. And the way to read this chart is that if these p-values are less -- if the p-values were greater than -- substantially greater than 5 percent, that would indicate that the diagnostic tests do not support the Z-test.

But if the p-values are less than 5 percent, it indicates that there's not a problem, not only with small sample, but all of the statistical challenges that they raise. These tests are immune from all of them, and the Z-test is valid.

Q. So challenges, they raised like pooled variance and continuity correction.

A. Right.

Q. These diagnostic tests are immune to that?

A. Right. The Fisher exact test, the Bootstrap test, the Binomial test do not require any of that. They do not require the -- they don't have the kind of variance in them

that one would have to make a decision as to whether to use pooled or unpooled, and there's no continuity correction ever necessary. And so these are immune from all of those statistical challenges.

The fact that these tests confirm the Z-test mean that each of those issues that they raised should not have been raised, they're not applicable here.

Q. And how does adding in this Cammer 5 factor affect your opinion on market efficiency?

A. It confirms, it confirms what the other Cammer and Krogman factors indicated. This is a -- Freddie Mac stock traded in an efficient market over the course of the class period and there's empirical demonstrations of it happening.

Q. Did Dr. Bajaj do any testing, such as he's done in other cases, in this case to prove that the market was inefficient?

A. No.

Q. Did he provide an opinion in this case that the market was inefficient?

A. No, he did not.

Q. What are the biggest mistakes that you would say the defendants and Dr. Bajaj have made in analyzing your work?

A. Well, I can narrow it down to two biggest. The first is they ignored all the Cammer and Krogman factors except for the empirical factor. They ignored that those are

dispositive. Defendants' counsel ignored them in his opening comments. They simply disregard that trading volume, analyst coverage, market makers, S-3 factors, market capitalization, bid-ask spread and float all indicate that Freddie Mac stock traded in an efficient market over the course of the class period. That's number one.

And number two is they consistently, repeatedly make the logical and statistical mistake of claiming that if a test fails to prove something, the test necessarily proves the opposite. Statistics textbooks are very clear that that's a logical fallacy.

So, for example, Dr. Bajaj tried to see if the misrepresentations and omissions had observable -- caused verbal statistically significant changes in Freddie Mac's stock on the misrepresentation and omission date. His test was weak. His test failed. But from the failure of his test to prove price impact, he then concludes that there's no price impact. And that's just a fallacy.

Q. I think there's an example that you used to explain this to me that involved fishing. Could you give that example to the court?

A. Well, again, I wish I could claim credit for it, but this comes out of statistics textbooks. If a fisherman puts a line into the ocean to try to catch a fish and catches no fish, that does not prove there are no fish in the ocean.

Catching a fish would prove there are fish in the ocean, but not catching a fish does not prove there are no fish in the ocean.

Q. Professor, I want to switch topics here and talk about price impact. You're aware that when market efficiency is proven, as in this case, the defendants have the opportunity to rebut market efficiency by showing a lack of price impact.

A. I'm aware.

Q. What would have to be done to show a lack of price impact in this case?

A. Well, no price impact means zero price impact. It would have to mean that there was no -- it would have to mean that the information didn't cause the price to go up, down or stay the same when the information came out, when the misrepresentations and omissions were made. It would have to mean that the information didn't make the price go up, down or stay the same when the corrective disclosures came around.

And then, because it's an efficient market, you would also have to prove that the information was the kind of information that is just irrelevant to the valuation of Freddie Mac stock. And they did not do any of that.

Q. In this case, would you expect that the misrepresentations and omissions alleged in this case would

cause a statistically significant price movement in the stock?

A. Not when those misrepresentations and omissions were made. Because my understanding of the allegations is, the allegations is the company was concealing increased risk, the company was concealing that they weren't adhering to underwriting standards.

So concealing something maintains the marketplace's understanding of the company's condition as it previously was. And so the efficient market reaction to that would be it maintains the stock price where it was. The efficient market reaction would be no price movement.

Q. Okay. Let's talk about November 20th, 2007. Was there a statistically significant stock price drop on November 20th? And I believe one of your prior slides addressed this, correct?

A. Yeah. It was not even close. It was a dramatic drop that clearly shows that the information that came out, the loss that the company experienced was responsible for the company's stock price plummeting that day.

Q. Has Dr. Bajaj proven that no part of that large stock price drop was related to the allegations in the complaint?

A. No. So, I mean, you would -- in order to prove no price impact, you would have to show that the drop was not caused by the announced loss, and you would have to show

that the announced loss was not caused by, in any way whatsoever in any form or to any degree, concealed risks or -- in a previously concealed risk or previously concealed underwriting standards being abandoned.

11:11:19 **Q.** I'm going to switch topics again, and I want to talk about your opinion with regard to a common damage methodology.

What was your opinion again?

A. That it exists. That there is a methodology, that it's
11:11:33 a methodology that's not only commonly -- can be commonly applied in this case to all class members, but it's commonly applied in other cases like this one.

Q. And when you say "other cases like this one," are you talking about Section 10b cases?

11:11:46 **A.** Yes.

Q. What's the common damage method that's applied in Section 10b cases?

A. It's usually referred to as the out-of-pocket measure.

Q. Have you given similar opinions regarding a common
11:11:57 damage methodology in other cases?

A. Yes.

Q. Have you seen other economists give similar opinions regarding common damage methodology for 10b-5 cases using out-of-pocket damages in other cases?

11:12:14 **A.** Yes.

Q. And would you say that the analysis that you performed was typical of the analysis performed by economists in reaching an opinion on common damage methodology in Section 10b cases?

A. Yes.

Q. Have you done an actual damage analysis?

A. No, not yet.

Q. Why not?

A. I haven't been asked to. I understand it's premature at this stage. And the full record has not yet been developed yet.

Q. Did the damages that you indicated could be applied class-wide depend on the individual risk tolerance of the investor?

A. No.

Q. Do they depend on whether or not the investor would have bought the stock?

A. No.

Q. Do they depend on whether the loss resulted from a corrective disclosure or materialization of the risk?

A. It does not depend on the form of the event that dissipated the artificial inflation.

Q. And when you say -- is there something called an inflation ribbon that gets dissipated in a case like this at the end?

11:13:28 11:13:43 11:14:02 11:14:20 11:14:40

A. Inflation is how much -- artificial inflation is how much misrepresentations and omissions have inflated or increased the stock price. And the ribbon, the inflation ribbon is the record, is the time series of inflation over the course of the class period.

So the measure is essentially subject to a number of statutory and case law provisions, it's essentially the change in the inflation ribbon from when the investor bought the stock to when the investor sold the stock.

Q. Now, Dr. Gompers has raised some issues about your ability to calculate that inflation ribbon, such as your ability to separate fraud from non-fraud losses.

How would you address those issues?

A. Well, the kind of financial analysis that's necessary to do that is financial analysis that's applied every single day by thousands of professional financial analysts in the marketplace analyzing every security that's out there.

I mean, valuation -- the valuation exercise is to determine how different pieces of information will impact the value of a security. And I would apply those very same tools that are used every day by professional financial analysts to this task, just as they do every day.

Q. And are issues like separating out fraud from non-fraud losses typical in 10b cases --

A. Yes.

Q. -- and loss causation analysis?

A. Yes.

Q. So it's something that you or other economists deal with every time they address one of these cases, for the most part?

A. Not every time, but frequently.

Q. Okay. Professor Feinstein, I want to go back. You were looking at a slide earlier that had over 50 cases where you've testified about market efficiency. In those cases, have opposing counsel sought to exclude your testimony under Daubert?

A. In many, if not most of them, they do. It seems to be a pretty routine tactic.

Q. In any of those more than 50 cases, was your testimony excluded under Daubert?

A. No, never.

MR. MARKOVITS: I have nothing further at this time, Your Honor.

THE COURT: Thank you. Dr. Feinstein is passed for cross-examination?

MR. MARKOVITS: Yes, Your Honor.

CROSS-EXAMINATION OF STEVEN P. FEINSTEIN, Ph.D.

BY MR. FRANK:

Q. Good morning, Dr. Feinstein.

A. Good morning.

MR. FRANK: Your Honor, we have prepared binders of exhibits that may be used during Dr. Feinstein's cross-examination. Would you mind if myself and my team distributed them?

11:16:00 THE COURT: No, I don't mind.

MR. FRANK: Thank you.

THE COURT: Your exhibits then are already marked?

MR. FRANK: They aren't already marked.

THE COURT: How do you intend to mark them, then, 11:16:08 if you distribute them in advance of marking them?

MR. FRANK: Well, I suppose we can -- we can mark them right now. And it will take me a moment to get to them, so we'll mark them while I begin the cross-examination, and then at the appropriate time, we can 11:16:23 distribute them.

MR. MARKOVITS: Your Honor, just a technical issue. That monitor, because of technical difficulties, the monitors were having us hooked up to our computer, so if Mr. Frank is going to be putting anything up on the monitor, 11:16:37 we'll have to switch that wire.

MR. LEWIS: I just need to get it --

MR. FRANK: I won't be doing that on cross-examination, we'll be doing that on the direct of the next witness.

11:16:46 THE COURT: Thank you for being ready, Mr. Lewis.

It looks like you're still on the wait list for that.

So when you're ready, you may present, but it seems it should be that the exhibits are marked before you give them to --

MR. FRANK: Thank you, Your Honor.

THE COURT: -- the witness and hopefully also to the court.

BY MR. FRANK:

Q. Dr. Feinstein, for a market to be efficient, it needs to be rapidly incorporating available information all the time, right?

A. Well, that's the perfect standard, the standard of perfect informational efficiency.

Q. That's what you testified at deposition was the definition of market efficiency, correct?

A. That's a definition of market efficiency. It's an operative definition of market efficiency. It's not the definition and the clarification, as I understand it, that the Supreme Court presented in the Halliburton II case. In that case, as you know, they said it's a fairly modest premise and it need not be perfect efficiency.

MR. FRANK: Your Honor, we move to strike. Doctor -- we move to strike the portion of the answer that is opining on case law, Your Honor.

THE COURT: I will overrule your motion to strike.

Listen, and I know already that there have been complaints that Dr. Feinstein makes legal conclusions.

I'll ask you to refrain from that and just keep your answers within the realm of the financial economist that you're serving in the role as.

THE WITNESS: Sure.

THE COURT: My goal here is to better understand. I think I can decipher what's a legal conclusion that should be drawn by the court versus one coming from the witness.

Feel free to mention it, but I won't strike, I'll just use it in an appropriate way. Okay?

MR. FRANK: Thank you, Your Honor.

BY MR. FRANK:

Q. Dr. Feinstein, the definition of market efficiency that you used here and that you applied here in reaching your conclusions was that information needs to be rapidly incorporating available information all the time, right?

A. Yes.

Q. Now, is it fair to say, Dr. Feinstein, that Cammer factor 5 focuses on the essence of market efficiency?

A. It focuses on it because it shows, it's a demonstration of the cause and effect. So it focuses on the market behaving efficiently rather than indicators that indicate that the market should be or is an efficient market.

So the other factors are the conditions under which a

market will be efficient. The empirical factor is a demonstration of the market actually behaving efficiently.

And so that's what I meant by the essence of market efficiency is in that demonstration.

11:19:22 **Q.** When you say that's what you meant, you're aware that you have previously stated in litigation that the empirical factor focuses on the essence of market efficiency?

A. And I explained in the language around that sentence what I just explained right now.

11:19:38 **Q.** Is it fair to say that the fifth factor is very important to the determination of market efficiency?

A. It depends. It depends on what the other Cammer and Krogman factors indicate.

Q. You were retained in the Groupon matter; is that right?

11:19:54 **A.** Yes.

Q. And you were deposed in that case?

A. Yes.

Q. And do you recall being deposed on February 12th of 2014 in Chicago in that case?

11:20:03 **A.** Not specifically, but generally, yes.

Q. And you were asked: "In your opinion, is the fifth factor the most important of the factors?"

And you answered, "It's different. It's different because it's the essence of market efficiency rather than an

11:20:19 indicator of market efficiency, so it's -- it's very

important."
Do you recall that?
A. I'm saying the same thing today.
Q. You agree it's very important?
A. Well, it's very important. It looks at market efficiency a different way. And its importance varies depending on what the other Cammer and Krogman factors say.
So, I mean, in a case where the Cammer and Krogman factors are not as dispositive as they are in this case, it will grow in importance.
Q. Now, in your initial report in this case, you reported the results from two tests, correct?
A. Yes.
Q. The first test you performed in this case was a single date event study that you testified earlier, right?
A. That's right.
Q. Prior to performing the single date event study, you reviewed Dr. Hallman's report dated August 16 of 2012, correct?
A. Yes.
Q. You knew that Dr. Hallman conducted an event study based on the testing of dates that Freddie Mac released earnings results, right?
A. That's right.
Q. You knew that he tested six earnings dates, correct?

A. That Dr. Hallman did, yes.
Q. Yes.
You knew that Dr. Hallman concluded, based on his testing, that only two of those six dates were statistically significant, correct?
THE WITNESS: Your Honor, I'd like to answer yes, but I'd like to provide some context, if I may.
THE COURT: Well, that's a question for Mr. Frank.
THE WITNESS: Okay. Yes.
THE COURT: He now knows what you desire. Would you like him to provide that context to you or to Mr. Markovits?
MR. FRANK: I'd prefer he provide it to Mr. Markovits given my limited time.
THE COURT: So why don't you just continue to answer Mr. Frank's questions, and if Mr. Markovits wants to come back and allow you to provide the context, he'll be able to.
THE WITNESS: Okay.
Please repeat the question.
BY MR. FRANK:
Q. I will try.
You knew that Dr. Hallman concluded that only two of the six dates that he tested were statistically significant?
A. Right. And he provided reasons for the other four.

Q. You knew that the two dates that he concluded had statistically significant price reactions were August 30 and November 20 of 2007, right?

A. Correct.

Q. And prior to performing your single date event study, you also reviewed Dr. Bajaj's report from 2012, correct?

A. That's right. And Dr. Bajaj provided the reason why the first four should not be statistically significant in an efficient market.

Q. Dr. Bajaj provided the reason or Dr. Hallman, did you mean to say?

A. Bajaj. Dr. Bajaj provided the reason. He said that the news on those first four earnings dates was mixed. If you recall the argument they were having, Dr. Hallman thought that the news was, even though not significant, was -- that the stock price reactions, even though not significant, were at least in the right direction.

And Dr. Bajaj said, "There was no right direction, the news was mixed. It could have gone in either direction."

If the news is mixed, then you wouldn't expect necessarily a significant stock price reaction. And those dates are then not appropriate for a market efficiency event study.

Q. Dr. Feinstein, let's focus on August 30 and November 20th for a moment.

Now, you knew that when Dr. Hallman offered his opinion that he failed to identify a structural break in the market for Freddie Mac's common stock, that impacted his results, correct?

11:23:32 **A.** My recollection is Dr. Hallman used the generalized least squares methodology to accommodate a structural break. So do you mean before or after he did that?

Q. Dr. Feinstein, do you recall that in Dr. Bajaj's report in 2012, he identified that there was a structural break in this market in August of 2007? 11:23:52

A. Right. He said there was one structural break, and that one structural break occurred on August 8th, 2007.

Q. Do you recall that the result of the identification of that structural break impacted Dr. Hallman's results when corrected for that break? 11:24:14

A. No, what I recall is that he applied a different methodology called feasible generalized least squares, which one can apply to deal with changing volatility over the course of a data series.

11:24:27 **Q.** Isn't it true --

A. I don't recall -- as I sit here now, I don't recall if -- well, we know that November 20th, 2007 is significant no matter how you looked at it. As I sit here now, I don't recall what happened to the earnings announcement that was just before that one. 11:24:43

Q. You knew that Dr. Bajaj agreed with Dr. Hallman with respect to the computations relating to November 20th, 2007, correct?

A. Agreed with him insofar as it being significant or agreed with him insofar as it not being affected by a structural break?

Q. I'll put it another way.

You knew that Dr. Bajaj didn't criticize Dr. Hallman's finding of statistical significance with respect to November 20th, 2007, correct?

A. That's true.

Q. You knew that Dr. Bajaj did criticize Dr. Hallman with respect to his finding of statistical significance on August 30, 2007, right?

A. Correct.

Q. Okay. And you actually agreed with Dr. Bajaj's conclusion that there was a structural break in August of 2007, right?

A. August; that's right, August. He said there was one structural break, only one structural break, and that it was in August of 2007. He said that volatility was constant throughout the period prior to that.

Q. And one of the things you did to confirm that Dr. Bajaj was right that there was a structural break in August, was you conducted what you call a Chow test, correct?

A. That's right.
Q. And the results of your Chow test confirmed that Dr. Bajaj was right that there was a structural break in August, right?
A. That's right.
Q. Now, you reviewed the third amended complaint in this case before conducting your event study, right?
A. Of course.
Q. And you knew that OPERS selected a class period that ended on November 20th, 2007, right?
A. Of course, yes.
Q. Now, you knew that the Freddie Mac stock price fell 29 percent on that day, right?
A. Right. And I knew that there was also very important news that came out that day that made it appropriate and almost a necessary to include that date in the event study.
Q. You concluded that -- well, strike that.
You're aware that the class period here is August 1st, 2006 to November 20th, 2007, correct?
A. Right.
Q. And you're aware that that constitutes 330 trading days, right?
A. Right.
Q. And you concluded, in connection with developing your single date event study, that there was only one date that

was appropriate to test in a traditional event study manner, correct?

A. Well, yes, because the earnings dates, as I already described, according to Dr. Bajaj, your own expert, were mixed news, except for the last one. He said they were mixed news. The literature says that mixed news events are not appropriate for inclusion in a market efficiency event study.

And beyond that, the allegations in this case are that the company concealed its deteriorating position in terms of risk and underwriting. If a company conceals its condition so as to appear uneventful, you should not be surprised that there will, therefore, not be a lot of events to test for a market efficiency event study.

And that's why I also did the collective test.

Q. Putting aside the earnings dates, you concluded that in the 330-day class period, there was not a single other date that was appropriate to test in a traditional event study, correct?

A. That's correct, and so did Dr. Bajaj. I invited Dr. Bajaj -- in my deposition, I said, "I invite your expert to propose other dates that ought to be tested." He never proposed any other dates that should be tested.

Q. Did he ever put in a report that he concluded that there were no other dates that were appropriate to test?

A. No. But the rebuttal, he never said that there was a date that was a better date or an auxiliary date or a second date or a third date that ought to be included.

No one in this case has ever said that there's a specific date that should be included in the event study aside from the November 20th, 2007.

The only exception is later, he said -- at the end of his report, he says that the earnings announcement dates might have been good dates to include, but he had previously said those were mixed news. So it's actually a conflicted opinion.

But nobody has ever suggested to me, in the course of this case, that there was another good date to test. I didn't find one, but neither did you.

MR. FRANK: Your Honor, I promise I will restrain myself and I will never move to strike at your request, but it may be that I'm going to have to ask for a little time at the end if we can't simply get answers to the questions.

THE COURT: Listen, I overruled your motion to strike and explained why. But you are certainly well capable of better controlling your witness. So I didn't mean to tie your hands entirely.

So the situation is this, Dr. Feinstein: You have points to make.

THE WITNESS: Uh-huh. Okay.

THE COURT: Literally as well as figuratively. Be responsive to the question. If Mr. Markovits wants you to expound, he'll give you the opportunity to do that. Mr. Frank has restrained himself and let you go on.

And I can't tell if you're happy with the response or unhappy until now.

But feel free to pause, Mr. -- I mean, pardon me, Doctor -- Dr. Feinstein, if necessary, but just answer the question and we'll leave the rest to Doctor -- to Attorney Markovits, should he choose to bring it up.

THE WITNESS: Yes.

MR. FRANK: Thank you, Your Honor.

BY MR. FRANK:

Q. Dr. Feinstein, in the Groupon case, you tested two dates, correct?

A. I don't recall, but it's reasonable.

Q. Do you recall that the class period in that case was less than two months?

A. I came prepared today to talk about this case. I don't remember the details of my prior cases.

Q. You don't recall --

A. I'll take your word for it.

Q. Do you recall that you testified in that case that testing only two dates was on the low side?

A. Yes, that I do remember.

Q. And that was two dates over something -- a class period less than two months, right?

A. Yes. I mean, that was the reason for there only being two dates in that case. And in this case, there are reasons why only one date is available.

Q. Now, in your report, you state that the statistically significant result on November 20, quote, "demonstrates that the common stock reacted promptly to new Company-specific information, which demonstrates market efficiency."

That's in paragraph 136 of your report. Do you recall that?

A. Yes.

Q. You didn't mean to suggest that your single date event study proves that Freddie Mac's stock price traded in an efficient market throughout the class period, did you?

A. Well, that is my conclusion from all of the analysis I did and from the entire battery, but that wasn't my conclusion from that test alone.

Q. And you were asked on direct examination by Mr. Markovits regarding your approaches to testing market efficiency in this case, and do you recall testifying that you've done it the same way for 22 years and dozens of cases?

Do you recall that?

A. Well, his question was about do I apply the battery of

tests that are the Cammer and Krogman factors, and that's what my answer "yes" was about.

Q. Now, so you didn't mean to suggest that for 22 years and dozens of cases, you have applied a single date event study and a Z-test, correct?

11:32:27

A. Correct. The empirical demonstration takes various forms depending on the facts and circumstances of the case, depending on the facts and circumstances of the company and the company's experience over the proposed class period.

11:32:44

Q. Now, in connection with Dr. Hallman's event study, he had to run a regression analysis, correct?

A. That's right.

Q. And you had to do that, too; is that right?

A. Yes.

11:32:56

Q. And Dr. Hallman used a control period or estimation period to do that, right?

A. Yes.

Q. And you used a different period, correct?

A. That's right.

11:33:03

Q. Now, with respect to the Z-test, that's a test that you sometimes referred to as an FDT Z-test, correct?

A. Yes, and sometimes it's referred to as the collective test.

Q. Well, there are other collective tests that aren't Z-tests, correct?

11:33:20

A. Correct.

Q. You refer to the Z-test that you ran here as an FDT Z-test because it was discussed in an article by authors with the initials F, D and T, correct?

11:33:35 **A.** Right. It was Ferrillo, Dunbar and Tabak, and they get credit for applying a Z-test as the statistical engine underlying a collective test.

Q. As of the date of your report in this case, you had never used a Z-test to assess market efficiency outside of

11:33:54 litigation, correct?

A. Correct.

Q. I'd like to --

MR. FRANK: Are they marked?

(Pause.)

11:34:20 MR. FRANK: If I could approach, Your Honor.

THE COURT: You may.

MR. FRANK: Thank you. Allow me to ...

Do we have one for the court? Thank you.

Thank you, Your Honor.

11:34:31 THE COURT: Thank you. Do you have two for us?

MS. RENSHAW: Yes, we do.

THE COURT: Would you give the other to my law clerk then? Thank you.

MR. FRANK: Your Honor, can I have two minutes

11:34:50 just to ensure that the exhibits are all straight away and

we don't have any technical difficulties as we proceed?

THE COURT: You may.

MR. FRANK: Thank you.

(Pause.)

11:35:36 MR. FRANK: Thank you, Your Honor.

BY MR. FRANK:

Q. Dr. Feinstein -- and I apologize, is it "Feinstein"?

A. I go by "Feinstein."

Q. Thank you.

11:35:45 **A.** My brother says "Feinstein," so ...

Q. When he's on the stand, I'll try to adjust.

Dr. Feinstein, let me turn your attention to Tab 3, which has been marked as Exhibit D3 in the binder before you.

11:36:06 Is this the FDT article on which you relied in running your FDT Z-test?

A. Yes.

Q. Okay. And that article was published in a law review, right?

11:36:17 **A.** Yes.

Q. It wasn't published in an economics or statistical journal, right?

A. Correct.

Q. It was not peer reviewed in the sense that is used in

11:36:24 your field, right?

A. In that sense, but it's peer reviewed in other senses.

Q. Well, it is not what you generally consider a peer-reviewed economics journal, right?

A. Correct.

11:36:35 **Q.** Other than that article, you don't know of any other published articles supporting the Z-test in the context of testing market efficiency, correct?

A. Well, we talked about this in the deposition. There's another article that speaks of the collective test for

11:37:05 market efficiency purposes, it's the Seyhun and Hartzmark article, but they don't use the Z statistical test as the underlying statistical driver. But it is a collective test of the same type.

Q. Now, let me turn your attention to Tab 4, which has

11:37:20 been marked as Exhibit D4. Are you there, Dr. Feinstein?

A. The declaration?

Q. Yes.

A. Yes.

Q. This is the declaration you submitted in this case,

11:37:32 correct?

A. Correct.

Q. And let me turn your attention to paragraph 22 of your declaration. Do you see paragraph 22?

A. Okay.

11:37:41 **Q.** And this is a -- if you look at the first sentence,

this is a sentence where you referenced the Z-test, correct?
A. Yes.
Q. Okay. And then in footnote 4, you cite statistical textbooks that support or describe the Z-test, correct?
A. Correct.
Q. And one of those statistical manuals is the "Applied Statistics for Public Policy" by Brian P. Macfie and Philip M. Nufrio, correct?
A. Yes.
Q. Now, let me turn your attention to Tab 5, which has been marked as Exhibit D5.
A. Okay.
Q. And this is an excerpt from the "Applied Statistics for Public Policy" textbook that you cite, correct?
A. Correct.
Q. And let me turn your attention to page 323. There are small page numbers in the top of the page.
A. One moment, if I can get my reading glasses on.
THE COURT: Sure.
THE WITNESS: Okay.
BY MR. FRANK:
Q. Do you see the first -- there's a larger in bold and italics "Sample Size"?
A. What page are you on?
Q. Page 323.

A. 323. "Hypotheses" -- "Hypothesis Test for Difference Between Proportions"?

Q. There's a section above that that's labeled "Sample Size."

A. Yes.

Q. Do you see that?

A. Yes.

Q. And the first sentence says, "Similar to the single population proportion test covered in Chapter 12, when testing for differences between population proportions, we cannot test hypotheses involving proportions from small samples."

Do you see that?

A. I see that.

Q. And then do you see that it states at the -- in the second paragraph, the last sentence, "The following three conditions must be met for both samples to assure the sample sizes are sufficiently large enough to conduct a hypothesis test for differences."

Do you see that?

A. These are the conditions that define whether it's a large sample or a small sample.

Q. Well, these are the conditions that must be met to assure that sample sizes are sufficiently large to conduct a test, correct?

A. No, I disagree with that. These are the conditions that would be met that tell you that there is assuredly no problem, no potential problem with small sample size. If there is a potential problem with small sample size, we can see whether it's an actual problem for small sample size by running diagnostic tests.

Q. This textbook doesn't say that, does it?

A. These tests do not tell you that the --

THE REPORTER: I'm sorry, one at a time, please.

THE WITNESS: -- diagnostic tests are important.

BY MR. FRANK:

Q. Nothing is stated in this textbook about these diagnostic tests curing sample size problems, is there?

A. I don't recall whether they talk about the diagnostic test, but it's well grounded in the literature that when there are small sample property considerations, you can check to see if it's a problem with Bootstrapping and alternative tests such as the Fisher exact test, which is immune to a small sample problem and the Binomial test. Those tests are weaker tests, but they're immune to small sample properties.

Q. Sir, in your initial report, you don't even cite your diagnostic test, do you?

A. Correct.

Q. In fact, at your deposition, you weren't even certain

of the results of those tests, correct?

A. No, I was certain. I was. I told you that I was. I told you that diagnostic tests were run and that they proved that there were no small sample issues at play.

Q. In your report, you don't cite any authority for the proposition that diagnostic tests can cure sample size problems, correct?

A. In the opening report; but in the rebuttal report, it's there.

Q. In the rebuttal report, you don't cite any literature supporting the view that your diagnostic tests can cure these sample size problems, do you?

A. No, I do. The rebuttal report, which has those three tests, cites to the authority for those tests.

Q. Now, but before we go on, let's just confirm --

A. Yeah, but --

Q. -- which of these --

THE COURT: No, no, no.

BY MR. FRANK:

Q. -- which of these conditions your Z-test fails. It fails the first condition, correct, there's not 30 observations, right?

A. Correct.

Q. Okay. And just so that the court can understand, the second and third conditions, the way we do the arithmetic

there, n1 refers to the number of observations, correct?
A. I'll take your word for it. I believe so.
Q. You're not sure?
A. Well, yes.
11:43:02 **Q.** And p1 refers to the proportion of the observations, right?
A. Correct.
Q. Okay. And so n1 here is 9, correct?
A. Right.
11:43:12 **Q.** And p1 here is 4 over 9, correct?
A. Right.
Q. Okay. And 9 times 4 over 9, as I remember from the way I used to do the arithmetic growing up, you just cross out the 9s, so 9 times 4 over 9 is 4, correct?
11:43:29 **A.** Correct.
Q. Okay. And we can agree that the number 4 is smaller than, not greater than 5, right?
A. Correct.
Q. And the next -- the next -- so we fail condition one
11:43:36 and we fail condition two, right?
A. Yes, but --
Q. And we fail condition three as well, don't we, Doctor?
A. Correct, which is why the diagnostic tests, which are immune to small sample property issues, are important here.
11:43:53 They confirm that the test nonetheless --

Q. Doctor, I confirm that Mr. Markovits will give you an opportunity.

THE COURT: Doctor, stop. Let Mr. Frank control the examination.

BY MR. FRANK:

Q. Now, you believe it was acceptable for your Z-test to violate the sample size conditions due to the results of the three tests you conducted that you call diagnostic tests, right?

A. That's right.

Q. And in his report, Dr. Bajaj opined that there's a structural break in this market in February of 2000 also, correct?

A. That's what he says.

Q. He opined that if your three diagnostic tests are adjusted to take into account the structural break, then those diagnostic tests yield statistically insignificant results, right?

A. Can you say that again, please?

Q. Dr. Bajaj offered the opinion that if your three diagnostic tests are adjusted to take into account the February structural break, that those diagnostic tests yield statistically insignificant results, right?

A. I don't think it was uniformly across all samples. In the latter sample is where he said it would be

insignificant.

Q. You accused Dr. Bajaj of data snooping, right?

A. Data snooping, data mining.

Q. You use those terms interchangeably?

11:45:22 **A.** Data mining is really what he did.

Q. Do you suspect --

A. Actually, yes, in this case, data snooping is one of the tricks that is often used in data mining, so we can use them interchangeably here.

11:45:33 **Q.** And you suspect he engaged in data snooping, correct?

A. I do.

Q. And you asked your team to check to make sure that Dr. Bajaj's computations were correct, right?

A. Well, I checked to see what kind of computations one 11:45:46 could run to create the illusion of a statistical break in February of 2007 when he previously said and provided evidence that there was only one break, and that one break was in August of 2007.

Q. Well, let's just talk about math for a second, Doctor. 11:46:01 Because parties and experts can have all sorts of disputes. And when we can reach agreement, the courts love it. And I just want to make sure there's no disagreement over the arithmetic. So let's talk about arithmetic for a moment. Okay?

11:46:16 You asked your team to make sure that Dr. Bajaj's

arithmetic calculations were correct, right?

A. Well, actually, he didn't provide his arithmetic calculations. What I asked my team to do was to examine to see if there are any calculations that could be run to see if there was a statistical break, a structural break where he said there might be one.

Q. Well, let's talk about the different sorts of calculations that are appropriate here. First, you had run a Chow test to assess whether there was a structural break in August, right?

A. Right. That's where he said --

Q. And you had concluded --

A. -- there was one and only one break.

Q. Sir, you had concluded that you agreed, based on your Chow test, that there was a break in August, right?

A. Yes.

Q. Okay. Now, after you saw that he asserted there was a break in February, you had your team run a Chow test to check his computations in February, correct?

A. Correct.

Q. And your team, and you ultimately, agreed that the computations were correct, the Chow test was consistent with a structural break, right?

A. I can't agree with that. That's not how you run a Chow test. You don't do data snooping and look throughout the

class period to find where it might pass.

Q. Did your team run a Chow test on the February date?

A. The Chow -- the computations we ran to confirm the arithmetic --

Q. And you confirmed the arithmetic was right, correct, sir?

A. -- but the appropriate --

THE COURT: Stop, sir. Were you finished with your answer?

THE WITNESS: No, I wasn't.

THE COURT: Let him finish.

THE WITNESS: The arithmetic we checked, but the appropriate testing to see if there was a legitimate break there is not what he did, and we confirmed that it's -- the confirming the arithmetic is not the same as confirming the results of a Chow test and confirming the conclusion of a structural break.

THE COURT: So it sounds as if you at least confirmed the arithmetic?

THE WITNESS: Correct. That's right.

THE COURT: Thank you, Mr. Frank.

MR. FRANK: Thank you.

BY MR. FRANK:

Q. Now, in connection with event studies and Z-tests in the past, you have tested earnings dates, correct?

A. Right, when appropriate.
Q. And in the past you've used earning dates as the dates that were tested for purposes of an FDT Z-test, correct?
A. When appropriate, yes.
Q. You included earnings dates in your report for Petrobras, right?
A. Correct.
Q. You included earning dates in your test for KBR, correct?
A. I just want to say included, but among other dates. And this test here also included earnings dates among other dates.
Q. You included earnings dates in your Z-test in the Electrobras case, right?
A. Yes.
Q. Did you exclude any earnings dates in those cases?
A. I don't recall that I did.
Q. Identifying earnings dates and testing earnings dates was the rule that Dr. Hallman used in selecting dates to test in his event study, correct?
A. Right.
Q. You didn't use that rule here, right?
A. And I explained why.
Q. Now, but just to be clear, you didn't use that rule, right?

A. Correct.
Q. And you didn't use Dr. Hallman's rule because you knew that it was already established that at least four of the six earnings announcement dates were such that they would not be statistically significant and you wanted to use a different approach that would provide new information, correct?
A. Well, the second half of your statement is correct. I wanted to use a different approach that would provide new information. But the reason for not testing, running the test on earnings dates was because it was mixed news and, as I said in the deposition, that territory had already been well trodden. It was mixed news. Your own expert said it was mixed news, so it wasn't appropriate.
Q. Well, you referred to your deposition, and you remember being deposed by me in my offices in Boston, right?
A. Right.
Q. Okay. And I asked you the following question and you gave the following answer:
"Question: Why shouldn't an economist like yourself use the same rule?" Referring to the Hallman rule.
You answered: "Because it was already established that at least four of the six earnings announcement dates were such that they would not be statistically significant. They already established that. So a different rule would provide

new information."

Do you recall that?

A. But they should not be statistically significant because of the mixed news.

Q. That's not what you said in answer to my question, is it?

A. It was.

THE COURT: Doctor, yes or no?

THE WITNESS: I disagree with your characterization of my prior answer.

BY MR. FRANK:

Q. Well, let me --

A. It's because of the mixed use --

THE COURT: Stop. It's enough. He'll ask the next question.

BY MR. FRANK:

Q. Let me be clear, because I don't want you to feel like I'm characterizing your answer. I want to read it correctly into the record, and tell me if you were -- you actually recall testifying to this.

I asked: "Why shouldn't an economist like yourself use the same rule?"

You answered: "Because it was already established that at least four of the six earnings announcement dates were such that they would not be statistically significant. They

already established that. So a different rule would provide new information."

Was that your testimony --

A. Yes, I said --

Q. -- at my offices?

A. -- that the events were such that they would not be statistically significant. That means the information was such that it should not be statistically significant. It doesn't mean that I then --

THE COURT: Sir, leave it there.

THE WITNESS: Okay.

THE COURT: Mr. Markovits can come back to it if he'd like to.

BY MR. FRANK:

Q. Now, you selected this Wall Street Journal/New York Times rule, correct?

A. I used the newspaper screen for the event dates.

Q. And the screen was that an event had to be reported upon by both The New York Times and The Wall Street Journal, correct?

A. In an article about Freddie Mac, right.

Q. And you had never used that rule in a prior case, correct?

A. I have not, correct.

Q. And you testified earlier that it's widely used, but

what you were actually referring to is the practice by some economists to use newspapers to identify when an earnings announcement or another corporate announcement is made public; isn't that right?

11:52:37 **A.** No.

Q. This rule isn't widely used, Doctor. You've never seen this rule used before, have you?

A. I presented in my rebuttal report examples of published, peer-reviewed articles in the finance literature

11:52:49 where the New York Times and Wall Street Journal are the sources for identifying events. That's in the rebuttal report.

Q. But this is a particular approach that it has to be those two articles combined, and you created it for this

11:53:03 case, didn't you?

A. I can't claim credit for the methodology of using The Wall Street Journal and The New York Times to identify when there's important news about a company. That's in the literature and I put that in the rebuttal.

11:53:22 I can claim credit for taking this well-established methodology that's in the literature and applying it to testing for market efficiency.

Q. Have you -- strike that.

Let me turn your attention to Exhibit 5 of what --

11:53:40 MR. FRANK: For the court's convenience, I will

tell you, it's been marked as both D1 and P1. It is the report of Dr. Feinstein. So it's in our binder as the first exhibit.

THE COURT: Thank you. And it's also on the docket, so I --

MR. FRANK: We apologize for the loss of paper.

THE WITNESS: Where should I --

BY MR. FRANK:

Q. Exhibit 5. It's page 79 of your report, Doctor.

A. I'm having trouble finding what you're --

Q. I'm sorry, Tab 1 in your binder --

A. Tab 1.

Q. -- is your report. And if you turn to page 79, you'll see Exhibit 5 to your report.

A. Yes.

Q. Now, it's your understanding that market efficiency relates to the impact of published information on stock prices, correct?

A. Say that one more time, please.

Q. It's your understanding that market efficiency relates to the impact of company-specific information on stock prices?

A. Yes; it relates to it, yes. It's whether or not that information is being ignored such that it's reflected, correct.

Q. And when information is published to the market, economists like yourself test whether or not it's being ignored or being incorporated into stock prices, right?
A. Correct.
11:55:12 **Q.** And the timing of publication matters, doesn't it?
A. Of the information?
Q. The timing of the publication of the information matters, right?
A. Yes.
11:55:20 **Q.** For example, if you felt that there was a material news event on January 5th and that event was published, it was made known to the market on January 6th, you'd want to test the stock price reaction on the 6th, correct?
A. No, not necessarily. I mean, if it happened on the 11:55:40 5th, let's say it was testimony on Capitol Hill and it happened on the 5th, and The New York Times and The Wall Street Journal report about it the next day, we know it's an important event, but we also know that people learned about it when the testimony occurred, because there are other news 11:55:55 sources, the news wires and so forth.
Q. And as an economist, you would want to check to be sure when people learned about the event, correct?
A. Right. Generally, you'd want to test the event when it happened.
11:56:07 **Q.** Now, let's take a look at your Exhibit 5. The first

date, you selected an effective date of news February 27th, correct?

A. Correct.

Q. And here it says Freddie Mac, under "The New York Times," we see an article was published on the 28th, correct?

A. Right. It was about an announcement -- there was an announcement made by the company on February 27th, and The New York Times and Wall Street Journal wrote articles about that announcement and Freddie Mac on the 28th.

So they identified that it was an important news event, a news event, but the event occurred on the 27th.

Q. Now let's take the next one. We see you chose April 18th.

A. Correct.

Q. We see that there is an article on the 17th and an article on the 19th, right?

A. Right.

Q. Okay. And what -- now, that article on the 17th, did you test the 17th to see the effect of the article on the 17th?

A. No. The event was -- what the 17th article said was that Freddie Mac was going to testify and propose a plan. There was basically an announcement that tomorrow, there was going to be an announcement by Freddie Mac about how they

11:57:34 will help with subprime borrowers.

Q. And you didn't do anything --

A. So the event -- the event was on the 18th. It was announced that the event was going to take place on the earlier day, and then The New York Times publishing a Bloomberg article reported on the event on the 19th.

Q. And you didn't include April 17th, the date of the announcement by The Wall Street Journal, in your study, right?

11:57:49 **A.** Well, the event hadn't happened yet. The testimony that the article is about hadn't happened yet; it happened on the 18th.

Q. Now, one of the events that you selected for your FDT Z-test was November 20th, right?

11:58:02 **A.** Yes.

Q. Now, please turn to Tab 3. Tab 3 is the FDT article on which you rely. This has been marked as Exhibit -- as Defendant's Exhibit D3.

A. Yes.

11:58:17 **Q.** And please turn to page 119 of the FDT article.

Are you there, Doctor?

A. I am now.

Q. Now, in this article, FDT explains how to construct a Z-test to test for market efficiency, correct?

11:58:43 **A.** They -- I don't -- I don't agree with that

characterization.

Q. Well, if you look at --

A. Because --

THE COURT: Let him continue his question.

THE WITNESS: Okay.

BY MR. FRANK:

Q. If you look at the article and you look at the bottom of page 119, you'll see there's a sentence that says, at the beginning of that paragraph, "Because stock prices move all the time, one must compare the movements in response to news stories with a control group of prices."

Do you see that?

A. Yes.

Q. Okay. And they say, "One way to do this would be to look at a sample of days in a class period exclusive of those days alleged to be corrective disclosures and perform a news search."

Do you see that?

A. I do see that.

Q. And they drop a footnote and they say, "The examination would exclude those days in which a corrective disclosure was made because plaintiffs would normally choose a class period where corrective disclosures coincide with large negative price movements; including those days in the analysis would bias the results."

Do you see that?

A. I see that they're saying this is one way to do it, and they have an opinion about whether or not the corrective disclosures should be included. I disagree with that portion. There's not just one way to do the test --

THE COURT: Doctor, you've said enough. I think that's responsive.

Mr. Frank?

MR. FRANK: Thank you.

BY MR. FRANK:

Q. Now, you disagree that a corrective disclosure day should be excluded, correct, you'd disagree with them on that point?

A. In some cases it might be appropriate to do so, but in this case, that was the most appropriate day to look at.

Q. You disagree with FDT on this point, correct?

A. Yes.

Q. Okay.

A. Actually, I don't think you've characterized the point correctly. But I disagree with --

Q. Now, you agree with them --

A. Like the way you're characterizing --

Q. Doctor --

A. -- that I disagree with.

Q. -- you agree with them that plaintiffs normally choose

a class period where corrective disclosures coincide with large negative price movements; do you agree with that?

A. No. I've had cases where the final corrective disclosure is not significant, it's not large, it's not always the case.

Q. Isn't it fair to say that in most securities cases, plaintiffs propose a class period that ends on a day where there's a large negative price movement?

A. I've had numerous cases where the end of the class period is not a significant movement.

Q. So it's not fair to say what I just said?

A. I can't agree with it here. I mean, I could do a count, but I don't have the count here.

What comes to mind is numerous times I've looked at class periods where the last day, the last corrective disclosure is not a statistically significant movement. Sometimes because it's a follow-up event that was expected, for example. So it's often the -- I would say it's often the case that the last day is not statistically significant.

Q. Now, you understand that OPERS has characterized November 20th in this case as a corrective disclosure day --

A. Yes.

Q. -- right?

And you included your November -- November 20 in your Z-test anyway, right?

A. Anyway? For good reason, yes.

Q. Now, you ultimately chose, through this rule, nine dates to test in your Z-test, right?

A. Nine dates that were identified by articles in The New York Times and Wall Street Journal about Freddie Mac, about Freddie Mac events.

Q. Now, in your view, the ninth date, November 20th, that was a material news day, right?

A. Yes.

Q. In your view, the other eight days were not material news days, correct?

A. I never said that. They weren't selected on the basis of being material news days. They were selected on the basis of The New York Times and The Wall Street Journal saying that those were newsworthy events.

Q. I just want your opinion so that the court and I understand what you believe regarding those other eight dates.

In your view, are those other eight dates material news dates or not?

A. I'm just afraid that what I answer here could be taken out of context.

For this test, they were not selected for purposes -- on the basis of being material news days or not, they were selected on the basis of being elevated news flow days, days

on which events occurred such that more information was coming out about Freddie Mac and -- about Freddie Mac according to _The Wall Street Journal_ and _The New York Times_. I --

THE COURT: I think that's enough, sir.

THE WITNESS: Okay.

THE COURT: Unless Mr. Frank would like you to go on.

BY MR. FRANK:

Q. No. I'm all set. Thank you, Doctor.

Three of the nine news dates -- should we call them news dates, is that fair, the nine dates, would you call them news dates?

A. News event dates.

Q. News event dates.

Three of the nine news event dates that you selected are earnings dates, correct?

A. That's right.

Q. You testified that you -- during your deposition that one of the reasons you did not want to examine the six Hallman earnings dates was because you did not want to tread over the same grounds.

Do you recall that?

A. Well, that's why I didn't use that rule for picking events.

Q. Nevertheless, three of the dates you tested were three of the dates he tested, right?

A. Because the objective screen of relying on what the editors of the New York Times and The Wall Street Journal identified picked those dates.

12:04:03

Q. Well, the --

A. I wasn't going to ad hoc eliminate them after it passed the screen. That would be --

Q. Regardless of the reason why, I just need an answer to my question just so the record is clear.

12:04:13

You tested three dates that were the same as three of the six dates that Dr. Hallman tested, correct?

A. I included in a test, a collective test, three dates that were also dates looked at by Dr. Hallman.

12:04:32

Q. Now, let me turn your attention to Tab Number 6. Tab Number 6, which is marked as Exhibit D6, is a New York Times article dated January 6, 2007.

Do you see that?

A. I do.

12:04:57

Q. It says, "Today in Business Freddie Mac Forecasts Losses."

Do you see that?

A. Yes.

Q. Now, January 6 is not one of the news event dates that you tested, correct?

12:05:13

A. What tab had the list?
Q. I believe that is Exhibit 5 of your report, which was Tab 1 in Exhibit 5.
A. I've got it.
12:05:27 **Q.** You're there?
A. Correct.
Q. Okay. So the record is clear, you didn't test January 6th in your Z-test, right?
A. I didn't include that, correct.
12:05:37 **Q.** Okay. And did you not include that because you didn't find a Wall Street Journal article about this event?
A. A Wall Street Journal article about Freddie Mac about this event, correct.
Q. Okay. So you excluded events even if they were
12:05:52 discussed by both newspapers because you had a criteria that Freddie -- that the article had to be about Freddie Mac?
A. I didn't exclude. I didn't like go through events and then exclude them. I included them based on a screen. I included them if there were articles about the company.
12:06:13 **Q.** Well, let me turn your attention to Exhibit D7, which is behind Tab 7.
A. Yes.
Q. And this is an article that appeared in The Wall Street Journal on January 6th, and at the end of the article, it
12:06:27 says, "Freddie Mac estimated it swung to a $550 million

third-quarter loss from a year-earlier profit of $880 million, citing a drop in interest rates."

Do you see that?

A. I see it.

12:06:49 **Q.** So this is an event that was reported by both The New York Times and The Wall Street Journal, but because it didn't meet your precise selection criteria, it didn't make it into your Z-test; is that fair to say?

A. It didn't pass the screen.

12:07:09 **Q.** Now, let's take a look at Exhibit D8, which is behind Tab 8.

Do you see this?

A. Yes.

Q. Exhibit D8 is a Wall Street Journal article from the 12:07:28 Asia edition, which happened to be among the documents you produced to us. This document at its top says, "Business Brief: Freddie Mac." And it's dated January 8th and it states, "Home-mortgage financier Freddie Mac estimated that it swung to a third-quarter net loss of $550 million from 12:07:48 net income of $880 million a year earlier, citing a drop in interest rates."

Do you see that?

A. I see that this is the Asia edition. I see that this -- this did not come up on the screen. This did not 12:08:01 come up on the screen, and I think the reason is you dug

deep. I give you credit for that. But this is the Asia edition and I don't think this was in The Wall Street Journal sources that I looked at.

Q. So information could be reported by The Wall Street Journal and The New York Times --

A. No.

Q. -- and yet not make it past your screen, correct?

A. No, I disagree with you. I see what you've done here. I don't -- The Wall Street Journal and New York Times sources that I looked at did not have this event reported by both. You've got a different edition of The Wall Street Journal that has the event, but it's not an edition or the version of The Wall Street Journal that was in my screen.

THE COURT: Dr. Feinstein, you were in the room. The parties didn't ask that witnesses be sequestered or separated when Mr. Frank stood and said, "Judge, you'll be happy to know that we've agreed on the authenticity of the exhibits. So every exhibit we give will be something that is what it purports to be."

I just repeat that to you.

THE WITNESS: Okay.

THE COURT: So you're not being tricked in my presence.

Is that the case, Mr. Markovits?

MR. MARKOVITS: I would respectfully disagree,

Your Honor, in the sense that if his screen was for Wall Street Journal articles --

THE COURT: The point is not whether or not he found it, the point is whether or not this is indeed an Asia edition Wall Street Journal article. Full stop.

MR. MARKOVITS: Full stop. On that, we have no disagreement.

THE COURT: Thank you. Keep that in mind. If you have another question, put it to the witness or move on.

MR. FRANK: Thank you, Your Honor.

BY MR. FRANK:

Q. Let me turn your attention to Exhibit D9, which is behind Tab 9.

Do you see Exhibit D9 is a Wall Street Journal article dated October 4th, 2006 with the title "Freddie Mac's Net Quadruples"?

Do you see that?

A. Yes.

Q. And you didn't include among the dates you tested in your Z-test an October 3 or October 4 date, did you?

A. For good reason, yes.

Q. Now, if you'd turn to Tab 10, which has Defendant's Exhibit D10, you'll see that there's a New York Times article dated October 2nd.

Do you see that?

A. I do.

Q. And at the bottom of that article, it says, the first page, "Freddie Mac Call -- Freddie Mac, one of the government-sponsored mortgage finance companies, will hold a conference call for investors to discuss its preliminary results for the first half and second quarter of 2006 on Tuesday."

Do you see that?

A. I see it.

Q. And so these two articles were also identifying an event, a news event for Freddie Mac, correct?

A. These are not articles about Freddie Mac. It's a New York Times article --

Q. Well, the first one is about Freddie Mac, correct?

A. Well, the way you characterized it, but let's be clear, it's not an article about Freddie Mac.

Q. Well, let's look at D9. Can we agree that the bold title of D9 under The Wall Street Journal is "Freddie Mac's Net Quadruples"?

A. Right, that satisfies the screen.

Q. Okay. But The New York Times article that appears on the next page that reports that the earnings announcements about to come out, that doesn't satisfy the screen because it doesn't have a subject line that says "Freddie Mac"?

A. Correct.

Q. Do you think that it matters to investors whether or not the name of the company is in the subject of the article?

A. I think it bears on the importance of the news according to the editors. The importance of the event according to the editors is what it bears on.

Q. Well, isn't an efficient market supposed to incorporate all publicly available information?

A. Right.

Q. So whether or not it's in the top of a New York Times article or in the middle of a New York Times article or the bottom of a New York Times article, investors who are following a company will trade on that information and not assist the market to become efficient, correct?

A. You're conflating -- yes, I believe that's the definition of an efficient market, where people do not ignore information, do not ignore news, and not all material news elicits a statistically significant stock price reaction.

But to run an empirical test to observe whether the market is behaving empirically -- behaving efficiently, you need an objective screening and you shouldn't deviate from the objective screening.

Q. Let me turn your attention to Exhibit D11. D11 is a Wall Street Journal article that's entitled "Freddie Mac Net

Rises Amid Mortgage Tumult," correct?

A. Yes.

Q. And it's fair to say that at this time, there was a mortgage tumult in the market; is that right?

A. Yes.

Q. There was a financial crisis brewing during this period, correct?

A. Yes.

Q. Now --

A. Well, yes.

Q. This is a March 24th, 2007 article from The Wall Street Journal that reports that "Freddie Mac reported a 3.8 percent increase in net income for 2006," right?

A. Yes.

Q. "Freddie Mac" is in the title, right?

A. Right.

Q. It reports an earnings announcement, correct?

A. Okay.

Q. Now let me turn your attention to D12. D12 is a New York Times article dated March 19th, 2007, several days earlier, which reports in the second paragraph "Housing Watch -- The housing sector will continue to draw attention this week. Among reports to be released are housing starts for February (Tuesday) and existing-home sales for February."

12:14:47 12:15:01 12:15:19 12:15:29 12:15:40

Do you see that?

A. Yes.

Q. And it refers to "Earnings Reports" at the bottom of the first page. And in the last sentence, it says, "Other earnings reports this week are Barnes & Noble, Borders, ConAgra, General Mills, Nike, Palm and Williams-Sonoma (Thursday) and Freddie Mac (Friday)," correct?

A. I --

Q. That's what it says, right, Doctor?

A. In an article that The New York Times determined was not an elevated importance news event to such an extent that it warranted an article about it, and cite -- an article about Freddie Mac. This is an article about a lot of other things and Freddie Mac is mentioned at the bottom. This is not an article about Freddie Mac.

Q. So if "Freddie Mac" had appeared in the subject line, it would have met your screening?

A. What do you mean "subject line," subject line of a search?

Q. Well, if you look at the article, it has a title, right, it says, "Fed Meeting -- The Federal Reserve Open Market Committee will conduct a two-day ..."

Do you see that?

A. I see that.

Q. Actually, it may be that the title of this article is

"The Week Ahead."
Do you see that?
A. Yes.
Q. And if that had said "The Week Ahead in the Life of Freddie Mac," it would have met your criteria; is that right?
A. Well, yeah. The screen was to identify events that were important events in the life of Freddie Mac according to the editors, important enough to warrant an article.
Q. Now, do you -- strike that.
Do you know how these dates would have changed your results had they been tested?
A. I didn't include them in the screen, so I do not know. They didn't pass the screen, so they weren't included in the collective test, news event dates.
Q. Now, you're aware that Dr. Bajaj offered the opinion that it was an error for you to fail to employ a continuity correction in your Z-test calculations, correct?
A. I know he said that, and he's wrong.
Q. Well, after you reviewed his report, you concluded that from your perspective, the failure to include a continuity correction was an error, but only an immaterial error, correct?
A. No.
Q. Well, you remember that you ended up testifying in my

12:17:11
12:17:19
12:17:32
12:17:42
12:17:48

office on three days, didn't you?

A. Right.

Q. That's because you hadn't provided your diagnostic test results on the first day and you had to come back a second day, right?

Do you remember that?

A. It's because you requested that I come back for more deposition testimony.

Q. Well, and then you submitted a rebuttal report and we got a right to a third deposition date, correct?

A. Correct.

Q. And do you recall that I asked you the following question and you answered it as follows? I asked --

MR. MARKOVITS: I'm sorry. Could we have a deposition transcript and page?

MR. FRANK: Sure. This is from the third day of the deposition, page 639, lines 10 to 14.

BY MR. FRANK:

Q. I asked --

THE COURT: Give Mr. Markovits a chance to get there.

MR. FRANK: Sure.

THE COURT: Mr. Markovits, when you reach, let us know.

MR. MARKOVITS: Yes, thank you.

BY MR. FRANK:

Q. "Is it fair to say, then, that from your perspective" --

THE COURT: Mr. Markovits, was that an "I've gotten there"?

MR. MARKOVITS: Oh, I am sorry. Yes, Your Honor.

THE COURT: Okay. Fair enough. Mr. Frank, go ahead.

MR. FRANK: Thank you.

THE COURT: Sure.

BY MR. FRANK:

Q. I asked: "Is it fair to say, then, that from your perspective, the failure to include a continuity correction is an immaterial error?"

And you answered: "In the context of all the findings, yes, absolutely."

Do you recall that?

A. I guess I was focused on the word "immaterial," not on the word "error."

Q. Okay. So you think that your testimony that you gave was inaccurate?

A. Yeah. I heard "immaterial." I was answering yes that I believe it was immaterial.

Q. You don't think it was an error?

A. No, because the diagnostic tests tell you that it's not

a problem.
Q. Well, wasn't it required under the principles of statistics to include a continuity correction?
A. If it's immaterial, it's not an error.
12:18:45 **Q.** And what happened in my office on that day, you just misheard the question?
A. Yeah, I heard the word "immaterial" and I answered yes, because I thought it was immaterial.
Q. Do you actually remember this?
12:18:57 **A.** Well, I'm thinking how I would have answered it now if you asked it right now. I can -- my understanding hasn't changed. My opinion hasn't changed. It's immaterial, it's not an error.
Q. Your statements under oath have changed, but your
12:19:11 understanding hasn't changed; is that right?
MR. MARKOVITS: Objection, Your Honor.
THE COURT: Sustained.
MR. FRANK: I'll move on. Thank you, Your Honor.
BY MR. FRANK:
12:19:17 **Q.** Now, Dr. Bajaj calculated the impact of a continuity correction here, correct?
A. I can't agree to that, because he didn't use the diagnostic test. So he didn't calculate the impact of not using a continuity correction. If he had used the
12:19:36 diagnostic test, he would have seen that it was immaterial.

Q. But by the way, returning to your prior testimony, do you recall that you had an opportunity to review your deposition transcript and correct it for any errors?
A. Yes.
12:19:50 **Q.** Okay. And you, in fact, reviewed the transcript and you corrected it for errors?
A. Yes. I was still at that time focused on the word "immaterial."
Q. Well, you corrected it for errors and you provided us
12:20:02 with this list of errors that you caught and fixed; is that right?
A. Yes.
Q. And you didn't correct this statement you made about the continuity correction, did you?
12:20:14 **A.** Correct.
Q. Now, with respect to calculations, you're aware that Dr. Bajaj offered the opinion that you should have employed a continuity correction, right?
A. Yes, he said that.
12:20:31 **Q.** And you're aware that he performed a calculation that if a continuity correction had been made, here's what the results would be, right, he did that?
A. Could I see his report? Because that's --
Q. You don't recall him --
12:20:43 **A.** I recall that he did that. Okay, if you're going to

ask what the change is, then I'd like to see the report.

Q. I didn't ask you what the change is.

But you recall that he did a calculation, right?

A. Right.

12:20:52 **Q.** And you had your team test all of his calculations, right?

A. Yes.

Q. Yeah. And you never concluded that that calculation was incorrect, correct?

12:21:03 I understand, Doctor, that you disagree whether, now, you disagree whether or not there should have been a continuity correction, but I'm just asking you about the math so we know whether there's a dispute about the math.

A. The arithmetic, right, there is no dispute about the arithmetic. 12:21:18

Q. No dispute? I'm sorry?

A. Correct, there is no dispute about the arithmetic.

Q. Okay. Now, you are aware that Dr. Bajaj testified in the Freddie Mac/Kreysar matter, correct?

12:21:41 **A.** I'm aware, yes.

Q. Okay. And you're aware that he did a put-call parity test on the common stock of Freddie Mac in that matter, correct?

A. Yes.

12:21:50 **Q.** Okay. And you're aware -- and let me turn your

attention to Tab 2, which is your rebuttal report. This has been marked as Exhibit D2. And if I turn your attention to paragraph 33, you'll see that you wrote, "In a related case concerning Freddie Mac Series Z Preferred Stock, Dr. Bajaj performed these same empirical tests, which he omits from his report in the current case."

And then you have three block quotes from Dr. Bajaj's Freddie Mac/Kreysar report; is that correct?

A. Yes.

Q. And the third one says, quote, "There was a significant increase in put-call parity violations for Freddie Mac's common stock during specific periods of capital market turmoil before and during the alleged class period," closed quote.

Do you see that?

A. I see it.

Q. Okay. And you were aware that Dr. Bajaj had written that in his report, correct?

A. Yes.

Q. Okay. And you didn't do anything to test whether or not that was correct, right?

A. It's immaterial. A put-call parity test is not a test of stock market efficiency.

Q. You didn't do anything to test whether or not that statement was accurate, correct?

12:23:29

A. I did not check that; yeah, I did not check that.

Q. And you don't have any reason to believe that there weren't a significant increase in put-call parity violations for Freddie Mac's common stock during this time, right?

A. Which time?

Q. Well, you read the Freddie Mac/Kreysar report, right?

A. Right.

Q. Okay. You knew there was a class period in that report, correct?

12:23:36

A. Yeah. What was it?

Q. You know the class period overlapped with this class period, right?

A. I'm sorry. I thought that class period began when this one ends.

12:23:46

Q. I think you may be thinking of the Kuriakose case. This is the Freddie Mac/Kreysar case.

In any event, you were aware that he had run this weak form test in that case, correct?

A. I can't agree with that statement. This is not a weak form test.

12:24:01

Q. You don't believe that a put-call parity violation test is a weak form test?

A. Correct, I do not believe that. Put-call parity is about a relationship in options prices. This is a test of whether or not option prices conform to a no arbitrage

12:24:14

restriction in the options market. It's not an appropriate test for stock market efficiency.

Q. For weak form stock market efficiency --

A. Any, because the stock can be --

12:24:26 **Q.** Just answer my question, please.

You don't believe it's an appropriate test for weak form market efficiency; is that correct?

A. Correct, I do not believe that.

Q. And just so the dispute --

12:24:34 **A.** I know it's not. I know that's the case.

Q. Just so the dispute between the experts can be clear, I want to be clear on this point as well. You don't believe that these failures -- strike that.

You don't believe that any failures to satisfy a weak form market efficiency test are relevant to whether the market is semi-strong form efficient, right?

12:24:49

A. I didn't say that. That's not what I said just now. Are you asking me about my testimony just now?

Q. No. I want to understand your opinion about the relationship between weak form tests and semi-strong form tests.

12:25:03

And just to be clear, let there be --

A. I think you need to give --

Q. -- let there be no mistake.

12:25:12 THE COURT: Let him finish.

THE WITNESS: You need to allow me to explain --

THE COURT: Dr. Feinstein, let him finish.

THE WITNESS: I thought you meant me.

THE COURT: He'll decide what it is he wants to have on the record.

THE WITNESS: Okay.

BY MR. FRANK:

Q. Now, is it your view that weak -- strike that.

Is it your view that semi-strong form efficient markets must satisfy weak form efficient market tests?

A. It depends which test.

Q. Well, let's take, for example, the put-call parity violations. Is that a weak form test?

A. No.

Q. Okay. Let's take all the tests you believe are weak form tests. Okay? If a stock market -- if a market for a security doesn't satisfy weak form tests, that you accept are weak form tests, can that stock market satisfy or be a semi-strong form efficient market?

A. In order to answer the question, you need to further elaborate on your hypothetical. Are you talking about perfect efficiency or imperfect efficiency?

Q. Well, you are using a definition --

A. Because if you give me some latitude, I can explain these terms so that we can all understand them.

Q. You're using a definition of "market efficient" in this case, right?

A. Yes.

Q. And your definition is semi-strong form efficiency in the informational sense, right?

A. Yes.

Q. Okay. I'm going to use --

In order to test whether or not a market is semi-strong form efficient in an informational sense, is it appropriate to test whether or not a market is weak form efficient?

A. In order to answer the question, I need to define some terms. Could I have some latitude to do that?

Q. Well, are these terms not generally accepted in your field?

A. Well, you've left out the dichotomy of perfect versus imperfect. You've talked about the taxonomy -- you've addressed -- you're mixing up different definitions of efficiency.

THE COURT: So let me ask this: As put to you, you're unable to answer Mr. Frank's question?

THE WITNESS: Because it's un- -- it's not well specified.

THE COURT: Is that a yes?

THE WITNESS: Yes, that's correct. It's not a well-specified question.

BY MR. FRANK:

Q. Is it your view that market efficiency, in the semi-strong informational sense, involves stock price reactions to all available information?

12:27:48 I'll put that another way because you seem to be struggling a little bit with it.

A. No, I was about to answer it.

Q. Now I've muddied the record so I'll try to make it clear.

12:27:59 **A.** The answer is yes, but the degree of all is what defines whether it's perfect or imperfect.

Q. Well, let's take -- let's just deal with subsets of information right now. The semi-strong form of market efficiency deals with the subset of information that is all available information, correct? Or I should say the set. It's not a -- the set of information is all available information, correct?

12:28:20

A. Correct, all publicly available information is what semi-strong addresses.

12:28:33 **Q.** And weak form, weak form efficiency relates to stock price reactions to a subset of all available public information, correct?

A. Correct. That information being old prices and old volume numbers, usually off of charts.

12:28:47 **Q.** Okay. So if a market isn't responsive to the subset,

that is, historical market prices, it cannot be said to be responsive to all information, correct?

A. It can be generally semi-strong efficient still. It can respond to important news events about the company where there may be some inefficiency with respect to old prices still.

So it can be the kind of efficiency the court is concerned about, meaning that it responds to corporate information, company information, misrepresentations and omissions, and yet there might be some tiny vibrations in the price that are correlated across time.

Q. And you believe --

A. Which --

Q. And you believe you're aware of case law that distinguishes between all the information and just practiced historical price information?

A. Is that a legal question? Can I answer that? Can I give a legal answer?

Q. I think you were just referring --

THE COURT: Hold on one moment. I think in terms of whether or not you can answer the question, if you're capable, yes.

But you have one minute left.

MR. FRANK: I will wrap up, Your Honor.

THE COURT: Well, can you?

MR. FRANK: I can. I can.

THE COURT: Would you like to rephrase your question?

MR. FRANK: I would like to withdraw that terrible question, Your Honor.

THE COURT: Don't worry, Dr. Feinstein, it's withdrawn.

MR. FRANK: Let me ask -- one minute will be a stretch, but I will see if I can do it.

THE COURT: Well, if you need just a few more than that, I'll give it to you, meaning like ten, but something less than that is ideal.

MR. FRANK: Reasonable. I think I'll be all right, Your Honor. Thank you.

BY MR. FRANK:

Q. You testified on direct about the low power of event studies in the Brav and Heaton article, correct?

A. Yes.

Q. Is it fair to say that the concerns raised in the Brav and Heaton article about low power of event studies do not apply in this case because the tests you conducted in this case do not exhibit that issue?

A. It's not fair to say that their concerns don't apply in this case, because your expert is trying to apply weak tests to show a lack of efficiency or a lack of responsiveness to

the -- the lack of price impact. It's directly relevant to this case because your expert is using weak tests and drawing improper conclusions from them.

Q. Let me turn your attention -- well, strike that.

12:31:14 You recall the first day of your testimony in my office?

A. Yes.

Q. And for Mr. Markovits' benefit, I will refer to your transcript on page 53 at line 20, where I asked you the

12:31:31 exact same question that I just asked you, and I said to you: "And is it fair to say that the concerns raised in that article don't apply to this case, because in your view, the event study and the Z-test you conducted here don't exhibit those -- that issue?"

12:31:54 And you said: "Yes, that's right."

And I asked you: "The low power issue is not an issue for the Freddie Mac case; fair to say?"

And you said: "That's what I concluded from the data and the statistical results. Can we take a short break?"

12:32:13 Do you recall that?

A. On the first day, before your expert submitted the rebuttal. My statement just now that it's relevant is because in the rebuttal report, which occurred after that testimony, your expert applied a lot of weak tests to draw

12:32:27 improper conclusions.

So it was a correct answer on the day you asked it. The answer today, now that your expert, Dr. Bajaj, is using weak tests to draw improper conclusions, is that the Brav and Heaton criticism is highly relevant.

12:32:42 **Q.** Dr. Bajaj doesn't use a weak test to draw improper conclusions in this case, you just made that up, didn't you?

A. No, I can tell you exactly where he does it. He looks at -- he draws -- he does a Z-test --

Q. He didn't do any weak power tests in this case.

12:32:59 **A.** He used weak tests, failed to find a relationship between the misrepresentations and omissions, and based on that failure to find a relationship, he said the misrepresentations and omissions had no price impact.

Q. That is --

12:33:11 **A.** That's exactly the Brav and Heaton criticism.

THE COURT: Stop. Stop, Dr. Feinstein. The question is, please identify --

BY MR. FRANK:

Q. Please identify all of the weak form tests that 12:33:18 Dr. Bajaj performed in this case.

A. I didn't say weak form tests, and the Brav and Heaton isn't about weak form efficiency tests, it's about tests that have low power to give a determinant result, a determinant conclusion. The word weak here is about the 12:33:33 power of the test, not about the efficiency.

MR. FRANK: Your Honor, I'll pass the witness. Thank you.

THE COURT: All right. Mr. Markovits, you've reserved how much time for redirect examination?

12:33:49 MR. FRANK: He has 19 minutes and we will afford him 20, Your Honor.

MR. MARKOVITS: We thought we had 20, but hopefully I'll be less.

THE COURT: Of course, Dr. Feinstein is all warmed

12:34:00 up for you.

REDIRECT EXAMINATION OF STEVEN P. FEINSTEIN, Ph.D.

BY MR. MARKOVITS:

Q. Dr. Feinstein, let's start with that last point. What were you talking about when you were indicating that

12:34:13 Dr. Bajaj's rebuttal report had a test that had low power?

A. He has a price impact test or a purported price impact test where he looks at 27 alleged -- 27 of the allegations, looks at the dates when the misrepresentations and omissions occurred and runs a collective test to see if those -- to

12:34:38 see if there was a difference in the price dynamics on those days versus the price dynamics on typical days.

Q. Why does it have low power?

A. Well, because the misrepresentations and omissions were confirmatory misrepresentations and omissions that would not

12:34:52 be expected to move the stock market. So the test is

destined to fail. It has low power to find a difference between the two samples.

Q. Now, a different subject. Mr. Frank in his examination handed you a booklet and went over a number of exhibits that had articles from The Wall Street Journal, from The New York Times that had some news about Freddie Mac, correct?

A. Correct. Or some mention.

Q. Some mention. Was that argument, that you should have included other days that had both Wall Street Journal and New York Times news about Freddie Mac, made in any report of any expert on behalf of Freddie Mac or in any brief that you read or document that you read that was produced by Freddie Mac prior to today?

A. Not that I recall.

Q. Can you tell me, how often was there news about Freddie Mac during the class period?

A. 2,900 articles written over that 16-month period that mentioned Freddie Mac, that just mentioned it, in the way that, for example, Mr. Frank pointed out.

Q. So if you were going to run a Z-test or a collective test, could you use as a screen as news days, news days where there's some mention of Freddie Mac?

A. No, because then pretty much every day would be included in the news day samples.

What you need for this test is a distinction between

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12:37:38

elevated news and typical days. Elevated is the key.

Q. A different point.

MR. MARKOVITS: Slide 8, please.

BY MR. MARKOVITS:

Q. Mr. Frank was talking to you about --

MR. LEWIS: It will come up in a second.

BY MR. MARKOVITS:

Q. I'm sorry, is it up on your screen?

A. Not yet. Now it is.

Q. Mr. Frank was talking to you I believe about the Z-test and your inclusion of the last date in the Z-test, which he was showing you the article, the FDT article, if you will, which suggests that you shouldn't include the last date, correct, that's what --

A. I recall, yes.

Q. All right. On slide 8, and in your original report, did you calculate the collective event test excluding that last date?

A. Yes. And even without November 20th, 2007, the collective event test indicates market efficiency, it indicates that the incidence rate of significance was greater in the news event date group than in the typical group, even excluding November 20th, 2007.

Q. And that's the column to the right there. And if you take, for example, the Binomial test, it says, "0.54

percent," correct?

A. Right. That number would have to be over 5 percent in order for there to be a problem indicated. It's well below 5 percent. It proves a significant difference in the price dynamics on news days than on non-news days.

12:37:55

Q. I want to address a different point now.

MR. MARKOVITS: Your Honor, may I approach the witness?

THE COURT: You may.

12:38:17

BY MR. MARKOVITS:

Q. Mr. Feinstein, I show you what's been marked as P3.

MR. MARKOVITS: (Handing.)

THE COURT: Thank you, sir.

BY MR. MARKOVITS:

12:38:28

Q. Could you identify that for the record, please?

A. This appears to be an expert report written by Mr. -- by Dr. Bajaj, dated October 11, 2016. It appears to be his market efficiency report in the Allergan case.

Q. Have you reviewed this report prior to today?

12:38:50

A. Yes.

Q. Mr. Frank was asking you about your event study, and in your event study, your use of one day and it being the last day of the period.

Do you recall that testimony?

12:39:05

A. Yes.

Q. And in this case, in the Allergan case, was Dr. Bajaj providing testimony for the plaintiff or the defendant?
A. I believe it was for the plaintiff in this case, in Allergan.
12:39:19 **Q.** And in Allergan, his conclusion on behalf of the plaintiff was that it was an efficient market?
A. Correct.
Q. Did he run an event study?
A. Yes.
12:39:30 **Q.** Did he also look at the Cammer and Krogman factors?
A. He did.
Q. I'd like you to turn to paragraph 14.
A. Okay.

MR. MARKOVITS: Kevin, could you put up Opinion 1, please?

BY MR. MARKOVITS:
Q. At paragraph 14, under "Opinion 1," Dr. Bajaj says, "The Cammer and Unger factors indicate that Allergan stock traded in an efficient market."
12:40:15 Do you see that?
A. I do.
Q. And the Unger factors are the same as the Krogman factors; is that correct?
A. Yes.
12:40:20 **Q.** And from your prior review of Plaintiff's Exhibit 3,

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12:41:00
12:41:08
12:41:16
12:41:29

was Dr. Bajaj's analysis of Cammer factors 1 through 4 and the three Unger factors in Allergan consistent with your analysis and methodology applied in this case?

A. Yes.

Q. Did Dr. Bajaj do an event study in Allergan?

A. He did.

MR. MARKOVITS: Slide 22, please, Kevin.

BY MR. MARKOVITS:

Q. Could you turn to page 25, paragraph 53, please? Are you there?

A. Page 25 --

MR. FRANK: Your Honor, I object to this line of questioning as beyond the scope of cross.

THE COURT: Thank you. Your objection is noted and overruled.

THE WITNESS: Paragraph 53?

BY MR. MARKOVITS:

Q. I'm sorry, paragraph 53, which is actually --

A. Page 24.

Q. Yeah.

THE COURT: Mr. Frank, if you'd like a few moments to recross on this topic, I'll allow it. All right?

MR. FRANK: Thank you, Your Honor.

THE COURT: So we're back to page 25, paragraph 53?

MR. MARKOVITS: I'm sorry, it's page 24, paragraph 53.

BY MR. MARKOVITS:

Q. And is this where his description of his event study starts?

A. Yes.

Q. And if you'd look at the slide, or you could look at the report, how many events did Dr. Bajaj use in his event study?

A. Looking at the slide, it's three events.

Q. One of those dates, April 22nd, was outside of the class period?

A. That's right, it was after the end of the class period.

Q. So he used two events during the class period?

A. Right.

Q. Was one of those events the last day of the class period?

A. Correct.

Q. We talked a little bit about the structural break, Mr. Frank raised some questions about that.

MR. MARKOVITS: Could you put up slide 42, please?

Jason, do you have this deposition testimony? It's from Dr. Bajaj, January 11, 2013 --

MR. FRANK: Page 176?

MR. MARKOVITS: Yes.

MR. FRANK: We do somewhere, thank you.

THE COURT: Would you like until he has found it, sir?

MR. FRANK: He has it on the screen, so I'm okay, Your Honor. Thank you.

BY MR. MARKOVITS:

Q. Can you explain to the court what your concern or issue is with this new, newly discovered structural break of Dr. Bajaj in his opposition report or rebuttal report?

A. Well, his conclusion that it even exists is derived from a violation of the scientific process. He previously examined the data and he previously opined and concluded, as it says here on the slide, "volatility over this control period was almost identical to volatility through August 8, 2007, during the class period."

So he previously said there was one structural break that occurred on August 8, 2007. He needed to say that when he was attacking Dr. Hallman before me. Now that he wants to attack my work, he suddenly conveniently discovered that there's another structural break.

The problem with that is it's data mining. Data mining is where -- it's essentially a bag of tricks that one can apply in order to create the illusion that there's a relationship or a break where one doesn't actually exist.

You look at various places where the -- you run the

test over and over and over again until you find one that, according to random volatility, based on random volatility, gives you the result you want. And that appears to be what he did. And I have a number of reasons for believing that's what he did. The main -- one of the main ones being that he said he previously examined the data, saw no break and now he says there is one.

MR. MARKOVITS: Slide 43, please.

BY MR. MARKOVITS:

Q. Professor Feinstein, can you tell the court, what does slide 43 reflect? And I'll say it's from the docket, 214.

A. Well, back when Dr. Bajaj wanted to argue that there was only one structural break and that that one structural break occurred in August of 2007, this is the exhibit he presented. This is from his report that he wrote in response to Dr. Hallman.

And you can see he's got the early period and the middle period, the way he drew this graph, it makes it looks like it's the same. He makes it look like it's the same. And that when things become unusual, it's on August 1st, 2007.

So when it was convenient for him to say there was only one structural break in August of 2007, this is the graph he presented. And this graph suggests that that's the case.

MR. MARKOVITS: Could you put on slide 44, please?

BY MR. MARKOVITS:

Q. And what is slide 44?

A. So this was in his rebuttal report when he wished to argue that there was another structural break now, and that that structural break not only occurred in February of '07, but occurred exactly on one of the event dates in February of '07.

12:45:39

And it's a blowup where he's honing in to try to create the illusion that there's something going on in February. But, no.

12:45:56

MR. MARKOVITS: Could you turn to slide 45, please?

BY MR. MARKOVITS:

Q. And what is slide 45?

12:46:05

A. This is instructive. This slide is very important, and this slide -- I mean, it pains me enough to say it, but this slide is the true indication of data mining. If you compare the two previous slides to what's going on in this slide, you can see the tricks that are applied.

12:46:20

Your Honor, please note that in the lower left-hand corner of this slide, where the Y axis begins, in the previous two slides, it began in the natural place, zero percent. Now he's got the slide -- the axis beginning at 5 percent. I mean, most graphs like this would start at zero. He starts his at 5. The previous graph went from 0 percent

12:46:40

to 50 percent. This one goes from 5 to 30 percent.

So he's manipulated the axis and he's controlled the amount of data that he's presenting on the slide to create the visual illusion that something is going on in February of 2007. But it's a visual illusion. This is one of the tricks of essentially lying with statistics.

But there's something even more instructive. Two other very instructive things on this slide. He does give the numbers for the VIX level on average, he draws a green line in the unshaded part and he gives a level at 11.5 percent, and he gives the level in the shaded part at 15.19 percent.

So whereas the illusion, he tries to make the case that there's a dramatic increase in volatility here, the numbers that are presented here show that it's a much more modest difference.

But what's very important also is that there are statistical tests that one can run to see if there's a meaningful difference between 11.5 and 15.19, the kind of test that I ran when I was doing the collective test.

He has no test here. There's no indication whether this 11.5 versus 15.19 is a statistically significant, important change in volatility that would require recognition of a structural break.

And the one more thing I want to point out on this slide, which was just -- I saw for the first time last

night.

What we're talking about here, Dr. Bajaj's case essentially is to argue that I have not proved market efficiency, that perhaps the market is not efficient, that there's no evidence or no indication that the market is paying attention to information such that information is in the stock price.

But if you look at point 2 in the description on this slide, I'll read it, it says, "In my report, I noted," and we'll skip 1, let's go to 2. Point 2 says, "there were a series of market-wide events resulting in a sharp market-wide stock decline."

Well, that's market efficiency. There he's making plaintiff's case. Here he's saying that events caused a stock price reaction. That's what we're arguing about today, and here he inadvertently conceded that, in fact, the market is efficient.

Q. I want to just touch briefly on another issue, which is this issue about why you didn't use earnings reports. Could you explain again to the court, because I think there was some issue of your ability to explain answers, can you explain why you didn't use the six earning dates?

A. The proper design for a traditional event study is to select events on the basis of was there -- was the news of such import and did it arrive at such an unconfounded way

that based on valuation principles, the valuation principles of finance, you would expect the price to move a significant amount.

One of the things that would make news or a mix of news not cause a significant reaction is if the news was mixed. If on the same day there was some positive news that came out about the company, and also some negative news, so that the combined news is mixed and the stock price stays the same or just moves a little bit in one direction or the other, but not a significant amount.

The event -- the traditional event selection methodology says to avoid those days, do not include the days that have mixed news, because when you observe a non-significant reaction, there's no way to know what caused the non-significant reaction.

There's no way to know whether it was a weakness in the power of the test because of the nature of the news, or a weakness in the market because of potential inefficiency. There's no way to separate those out.

Based on all these Cammer and Krogman factors, it's pretty clear that using those dates would produce a non- -- would indicate a non-significant reaction, but that would not be weakness in the marketplace, that would not be weakness and efficiency in the marketplace, it would be weakness in the test because of the mixed character of the

news on those days.

In other words, it just can't be informative. Mixed news days cannot be informative about market efficiency in the traditional event study.

12:51:13 **Q.** And in this case, has Dr. Bajaj argued that those earnings dates were mixed news dates?

A. He's the one who said so, right. And I confirmed that, I looked.

MR. MARKOVITS: Can you --

12:51:24 THE WITNESS: The Credit Suisse reports, for example, they say that.

MR. MARKOVITS: -- slide --

BY MR. MARKOVITS:

Q. If you'd look at line [sic] 9, it's an excerpt from

12:51:35 Dr. Bajaj's prior report relating to Dr. Hallman --

THE COURT: Which slide is this, sir?

MR. MARKOVITS: Excuse me?

THE COURT: Which slide are you showing now?

MR. MARKOVITS: Is it not up?

12:51:50 THE COURT: Right, it is up, but for the record, you and your witness were speaking at the same time. And now it's also line 9?

MR. MARKOVITS: No, I'm sorry, it's slide 9.

THE COURT: Okay.

12:52:02 MR. MARKOVITS: It's an excerpt from the report.

It's Docket Number 214-5, dash 5.

THE COURT: Thank you.

BY MR. MARKOVITS:

Q. Professor Feinstein, is this part of the basis for your statement that Dr. Bajaj found mixed news?

A. Yes. He says that the -- he points out that Dr. Hallman said the news was generally negative on two of the days, positive on one of the days and in line on a fourth day. And then Dr. Bajaj says -- Dr. Hallman said that.

Dr. Bajaj says that if you look at those same days, you'll find inconsistent analyst commentary that indicates the opposite.

So that there's a mix of news. There's positive news on the positive day that Dr. Hallman identified, but Dr. Bajaj identifies negative news on that same day. And the days where Dr. Hallman found negative news, Dr. Bajaj produced positive news. So it was clearly mixed news.

And that's the explanation for why those were non-significant price movements. In an efficient market, the efficient response to mixed news would be a non-significant stock price reaction.

Q. Dr. Feinstein, your opinion is that this market was semi-strong form efficient?

A. Yes.

Q. If there was some lesser form of efficiency that was legally required, general efficiency, by definition, would that standard be met as well?

MR. FRANK: Objection.

12:53:31 THE WITNESS: Yes.

THE COURT: Overruled.

MR. MARKOVITS: I have nothing further at this time. I pass the witness for any recross on the Allergan report.

12:53:40 THE COURT: On that, certainly, but if there is -- you didn't use all of that ten minutes I was willing to give you, so I think you may have seven of it left --

MR. FRANK: Thank you.

THE COURT: -- for recross-examination.

12:53:53 MR. FRANK: Thank you, Your Honor. The parties agree that the most important factor of the day is the lunch break, and so we will be very quick with our recross.

RECROSS-EXAMINATION OF STEVEN P. FEINSTEIN, Ph.D.

BY MR. FRANK:

12:54:04 **Q.** Dr. Feinstein, you testified about the Allergan report in your redirect, correct?

A. Yes.

Q. And this is a case in which Dr. Bajaj represented -- was retained by a plaintiff, correct?

12:54:14 **A.** Correct.

12:54:24
12:54:38
12:54:47
12:54:52
12:55:04

Q. And there were 39 trading days in that class period, correct?
A. I recall that's about right.
Q. And he tested three of them in a traditional event study, correct?
A. Yes.
Q. And in this case, there are 330 trading days, and you tested only one date in a traditional event study, right?
A. In the traditional, and nine in the collective test.

MR. FRANK: I have no further questions, Your Honor.

THE COURT: Thank you.

Mr. Markovits, anything?

MR. MARKOVITS: Just one more question, Your Honor.

THE COURT: All right, then.

MR. MARKOVITS: Last question, just following up.

FURTHER REDIRECT EXAMINATION OF STEVEN P. FEINSTEIN, Ph.D.

BY MR. MARKOVITS:

Q. Mr. Frank asked you if he tested three event days during the class period. It was actually two event days during the class period and one after the class period, right?
A. That's right.

MR. MARKOVITS: Nothing further, Your Honor.

THE COURT: Certainly.

That sounds consistent with earlier testimony, Mr. Frank. Anything else?

MR. FRANK: No, Your Honor. Thank you.

12:55:09 THE COURT: All right, then. Then you're right, we're now to the lunch break scheduled. You've allotted yourselves 45 minutes. I think that's appropriate. We can agree, then, it's nearly five till noon, so we should resume at -- I'll give you until a quarter -- pardon me, five till

12:55:29 one -- a quarter till two, an extra five minutes.

MR. FRANK: Thank you, Your Honor.

MR. MARKOVITS: Thank you, Your Honor.

THE COURT: All right, then. Please refresh yourselves and we'll continue with the examination of

12:55:38 Dr. Bajaj.

MR. FRANK: Thank you, Your Honor.

MR. MARKOVITS: Thank you.

THE COURT: We're adjourned for lunch.

LAW CLERK: All rise.

THE COURT: Don't mind me, I'm just going to tidy my papers. Feel free to move around.

Thank you, Doctor.

THE WITNESS: Thank you, Your Honor.

THE COURT: Let me ask you, Counselors, is there

12:55:59 any reason Dr. Feinstein is required to stay in the

courthouse?

MR. FRANK: I don't believe so, Your Honor. I think some things may depend.

MR. MARKOVITS: He may stay if --

12:56:11 THE COURT: He's certainly welcome to stay now. Sometimes witnesses like to leave when they've completed their testimony. So I'd like you to tell us, because you know while he's here, he remains under oath. So you can't speak with him privately about something like, "We're going 12:56:26 to call you again," without any further conversation. But if he is told now by me, that's probably best. If you know.

MR. MARKOVITS: We're not going to call him for any further testimony.

MR. FRANK: We're not going to call him either, 12:56:42 Your Honor.

THE COURT: What's your intention, are you staying?

THE WITNESS: I was planning to stay. I'd like to stay.

12:56:47 THE COURT: You're welcome to stay.

THE WITNESS: Thank you.

THE COURT: It sounds as if no one intends to call you, but you'll be here if that changes. Enjoy your lunch break as well.

12:56:55 THE WITNESS: Thank you.

THE COURT: Certainly.

(Luncheon recess had at 12:57 p.m.)

AFTERNOON SESSION

- - -

(Proceedings resumed at 1:54 p.m.)

THE COURT: It appears we had a time discrepancy. Mr. Markovits, you took more like 90 minutes than 60 in your -- pardon me, more like 75 than 60 in your examination. So when your colleagues on the other side said you had about 19 minutes left, by my count, you really didn't.

MR. MARKOVITS: We kept track as well.

MR. LEWIS: We started at 10:34 a.m. to 11:14 a.m.

MR. MARKOVITS: They had me right at 60, correct?

MR. LEWIS: Yes.

THE COURT: Sixty including your redirect examinations?

MR. MARKOVITS: Yes.

THE COURT: My math is different, but if you're happy with that, because what I want to make sure of is that things are as fair as they should be and is in accord with the schedule as they should be, because for the next examination, there is 60 minutes, which was what was allotted for Dr. Feinstein as well. And I want to make sure that you're comfortable with that and don't believe that you will be slighted if I hold you to that 60 minutes.

Mr. Frank, or the one of you questioning your expert?

MR. FRANK: I think we can accomplish what we'd like to accomplish in 60. At the end, if I beg some leeway, I may do that, but hopefully I can avoid prostrating myself in that way.

13:56:04 THE COURT: All right, then. And it sounds like the plaintiff's team has no problem with that because they believe they didn't go over and hope you won't either.

MR. FRANK: Very good.

THE COURT: All right. Sir, will you please call 13:56:15 your witness?

MR. FRANK: Thank you, Your Honor. We would call Dr. Mukesh Bajaj to the stand.

THE COURT: Dr. Bajaj, thank you for starting. Approach to be sworn.

13:56:28 MUKESH BAJAJ, Ph.D., of lawful age, a witness called by the Defendants, being first duly sworn, was examined and testified as follows:

THE COURT: Thank you, Doctor. You saw where Dr. Feinstein was. If you'll position yourself there.

13:56:42 Have you already poured a cup of water?

Mr. CSO, please.

THE WITNESS: Thank you, Your Honor.

THE COURT: Thank you, sir. Make yourself comfortable there. Now that our sound system is working -- 13:57:01 right, Mary?

THE REPORTER: Yes.

THE COURT: -- the microphone will help.

Whenever you're ready, Mr. Frank.

MR. FRANK: Thank you, Your Honor.

13:57:11 DIRECT EXAMINATION OF MUKESH BAJAJ, Ph.D.

BY MR. FRANK:

Q. Dr. Bajaj, could you please describe your educational history?

A. Yes, happy to. And good afternoon.

13:57:16 **Q.** Good afternoon.

THE WITNESS: And good afternoon, Your Honor.

THE COURT: Good afternoon.

THE WITNESS: So I got my Ph.D. in financial economics from University of California at Berkeley. Prior 13:57:25 to that I got an MBA from University of Texas at Austin. And before that I had an undergraduate degree in chemical engineering from Indian Institute of Technology in Delhi, India.

BY MR. FRANK:

13:57:38 **Q.** Would you please describe for the court your employment history?

A. I'm currently Managing Director in charge of securities practice at Navigant Consulting, which is an international economic consulting firm.

13:57:52 Prior to that joining Navigant, I was in similar firms

that provided similar line of work, internationally as well. I've been consulting for the last, let's say, 25-odd years.

And I also taught for seven years at University of Southern California. And since 1997, I've taught a total of around 25 years at University of California Berkeley, 18-odd years after 1997.

Q. Have you published articles on the subject of financial economics and event studies?

A. Yes. I've published more than 25 articles, including some in the top finance journals, such as Journal of Finance and Journal of Financial Economics. A significant proportion of my work has been on event studies and market efficiency issues.

Q. Have you peer-reviewed articles on the subject of financial economics and event studies?

A. Yes.

Q. Have you taught graduate level courses on financial economics and event studies?

A. Yes.

Q. Have you conducted event studies for purposes other than litigation?

A. Yes.

Q. Would you mind describing those?

A. Yes. So, for example, I've used event studies to consult with several Silicon Valley firms in connection with

the proposed acquisitions, and I have used event study in order to advise clients in nonlitigation context as well.

Q. Have you taught and published on the subject of market efficiency?

A. Yes.

Q. What were you initially tasked to do in this case?

A. I was asked to examine expert report by Dr. Hallman that plaintiffs in this case had filed, I believe in 2012.

Q. And did you reach any conclusions?

A. Yes.

Q. Can you summarize those conclusions?

A. Yes. I concluded that Dr. Hallman had not established that Freddie Mac stock traded in an informationally efficient market over the class period.

Q. At some time did your assignment in this case change?

A. Yes.

Q. Why was that?

A. Because plaintiffs put forth a new expert and a new expert report by Dr. Feinstein.

Q. What were you then tasked to do?

A. I was asked to examine Dr. Feinstein's report and to comment on his analyses and conclusions.

MR. FRANK: Your Honor, may I approach?

THE COURT: You may.

MR. FRANK: Does the court have a copy of this?

MS. RENSHAW: No.

MS. HAYS: May I approach?

THE COURT: Thank you. Please do.

MS. HAYS: Here, Your Honor.

14:00:48 THE COURT: Thank you.

BY MR. FRANK:

Q. Dr. Feinstein -- excuse me. It was a long morning.

Dr. Bajaj, you have before you a series of exhibits that have been premarked. Let me turn your attention to 14:01:12 Exhibit 3 -- I mean Tab 3. This is Exhibit D14, Tab 3 in the binder, Exhibit D14.

Do you have that before you?

A. Yes.

Q. Okay. If you'd turn to paragraph 266. Before we do 14:01:29 that, you recognize D14, correct?

A. Yes.

Q. What is D14?

A. It is the amended complaint that's at issue in these proceedings.

14:01:42 **Q.** And you reviewed this amended complaint in connection with your work?

A. Yes.

Q. If you'd turn --

THE COURT: If you don't mind, it's the third 14:01:47 amended.

MR. FRANK: It is the third amended complaint, to be accurate. Thank you, Your Honor.

THE COURT: Certainly.

BY MR. FRANK:

14:01:52 **Q.** Now, if you'd turn to paragraph 266, which appears on page 117 of the third amended complaint, you'll see the second sentence states, "At all times relevant to this Complaint, the market for Freddie Mac common stock was an efficient market for the following reasons, among others:"

14:02:15 Do you see that?

A. Yes.

Q. And then in paragraph 267 on the next page, they state, "As a result of the foregoing, the market for Freddie Mac common stock promptly digested current information regarding 14:02:28 Freddie Mac from all publicly available sources and reflected such information in the market prices for Freddie Mac common stock at all relevant times."

Do you see that?

A. Yes.

14:02:39 **Q.** Is this consistent with how financial economists view market efficiency?

A. Yes.

Q. Are there different levels of market efficiency?

A. Yes. There are three different levels of market 14:02:52 efficiency.

Q. What are the three different levels?

A. So the weakest level of market efficiency, Your Honor, is called the weak form of market efficiency. And the way I explain it to my classes is you shouldn't expect to see if there's a publicly traded company that's in the business of selling ice creams, that when the business is good in the summer months, the price is high, and vice versa during winter months. Because that would create an opportunity for investors to buy the stock in the winter months and sell it in the summer months.

So in a market that is weak form efficient, you don't find such exploitable price trends. So charting a historical stock price is not going to help you with regards to meeting or exceeding your investment objective. Market at least incorporates historical price information correctly in the stock price. That's called the weak form of market efficiency.

Q. I believe you said there were three forms. What are the two other forms?

A. So the second form of market efficiency, which builds on the weak form of market efficiency, is the semi-strong form of market efficiency. Which states, just like the passage in the complaint that counsel read, is that the market not only takes into account historical prices in setting today's prices, the market takes into account all

relevant public information. So if somebody were to come to you and say, "Well, demand for oil is going up in emerging market, so it's a good time to buy all stocks," that's not going to help you outperform the market because that information is already reflected in prices of oil stocks today. That's called the semi-strong form of market efficiency.

And then finally, there's a theoretical artifact which nobody believes describes the real world, but that's called the strong form of market efficiency, which says both public and private information is reflected in stock prices. And that's just a theoretical standard or threshold.

Q. What is informational efficiency?

A. So over the last 40, 50 years since Professor Fama described market efficiency the way I have described it, there has been a lot of research and some disagreement amongst economists as to whether market prices are always correct relative to their economic fundamentals. Are there instances when there could be price bubbles, for example, or when prices are artificially depressed.

So one thing financial economists generally agree on, while they may disagree on how often the market is correctly fundamentally priced, is that if you have an efficient market, it will reflect new information that is material into stock prices promptly and in the correct direction.

And that form of market efficiency, which is a semi-strong form of market efficiency, but not in the fundamental sense, is called informational efficiency, and that is the standard that I understand to be applicable in cases like this.

Q. So is there semi-strong form informational efficiency and semi-strong form fundamental efficiency?

A. Yes.

Q. Okay. And what standard did you apply in this case?

A. I applied the semi-strong form informational efficiency, because that's the only type of efficiency that is tested through event studies. Event studies are, in fact, the definition of semi-strong form of efficient market hypothesis in the informational sense.

Q. What makes markets efficient?

A. So, generally, investors try to take into account public information when they invest in stocks. And once in a while, when professional investors that follow certain stocks professionally feel that the market is not correctly priced in the fundamental sense, then they try to trade, or even in an informational sense, then they try to trade to take advantage of those mispricings. They are called arbitrageurs.

And it's the activity of arbitrageurs that is considered the lifeblood of an efficient market. That's

what keeps market efficient.

Q. Are large companies that are well followed always efficient?

A. Well, if you are considering investing in stock of a large, well-followed company, it would be reasonable for you to expect that the stock is reasonably efficiently priced in the marketplace, and it's not well advised for you to actively trade the stock in order to do better.

But that doesn't mean all large companies are always correctly traded. And, in fact, one of the Nobel Laureates in economics, Professor Joseph Stiglitz, along with Professor Grossman, wrote one of the seminal papers in economics, which is called the Paradox of -- or the "Impossibility of Informationally Efficient Market."

And there is the paradoxical question. If the market is always assumed by everybody to be efficient, then nobody would have incentives to look for any information, look for any mispricing, in which case, of course, the market will cease to be efficient.

And the way they explain markets work in the real world is that there is always some degree of inefficiency in stocks that creates enough room for arbitrageurs to be doing the kind of arbitrage trading that on average keeps markets reasonably efficient.

So, in fact, while it's a good presumption that from

the point of view of an investor, large, well-followed stocks are efficiently priced, so don't bet your house trying to speculate on a stock, that does not mean that large company stocks are always, in fact, trading in an efficient market.

Q. How, if at all, does the notion of predictable direction relate to semi-strong form market efficiency in the informational sense?

A. So may I explain this concept through an example?

Q. Sure.

A. So let's say a drug company is testing for efficacy of a drug. And they have a group of people in a blind study who are being given the drug, and then a control group of people who are being given placebo.

Now, you would only say this drug is efficacious if people on the drug have better health outcomes than people who are taking placebo. You won't say that the drug is efficacious just because it has more extreme outcomes. If the drug is killing every patient, you wouldn't call the drug effective.

It's the same thing for market efficiency. Whether or not stocks promptly price material new information is a backward statement, unless you consider the directionality of that information; namely, when there is good news, stock prices go up, when there is bad news, stock prices go down.

And that is the definition of informational efficiency in the semi-strong form sense.

Q. How do economists test for market efficiency?

A. Well, as I was describing, a market that is weak form efficient -- that is not weak form efficient cannot, as a matter of logic, be semi-strong form efficient.

So if one is doing an affirmative analysis, it's good practice to first test whether the market is at least weak form efficient. Because unless it's weak form efficient, as a matter of logic, it cannot be semi-strong form efficient.

And the main test, in fact, the only valid test of semi-strong form of efficiency that follows from the definition is an event study.

So if market is not weak form efficient, then the cause and effect that you test in an event study; namely, date and unexpected corporate announcement or information release promptly get reflected in stock prices, could not be properly tested because there would be no time consistency between the price change you will be measuring and associating with stock return.

So it is through event studies that economists, financial economists test semi-strong form of informational market efficiency.

Q. Before we talk more about event studies, can you explain to me the relationship of weak form market

efficiency to semi-strong form market efficiency using your ice cream truck example?

A. So let's say booming sales in the summer months are not taken into account by the market until fall. So now you're observing an event that happened in the fall to do an event study. Then the price change that you're observing and seeing whether it corresponds to what was caused by that event that you're studying wouldn't be the contemporaneous price change, it will be the historical price change.

So, therefore, you cannot meaningfully test for semi-strong form efficiency unless and until prices are at least weak form efficient. There is no disagreement in economics literature on this issue, none whatsoever.

Q. Now, assuming the market is weak form efficient, what are tests of strong form efficiency?

A. Event study is the only test of semi-strong form of market efficiency that I can think of.

Q. Now, you heard Dr. Feinstein testify about the Cammer and Krogman factors, right?

A. Yes.

Q. How do the Cammer and Krogman factors relate to market efficiency?

A. So, again, if you'll indulge me, I'd like to use an example.

Q. Sure.

A. So if a patient goes to an emergency room, Your Honor, complaining of chest pain, the first thing that will happen is somebody will take the pulse of the patient, the blood pressure, check the vital signs. Of course, if you don't have a pulse, you are in trouble. But just because you have pulse doesn't mean you are healthy if you are complaining of chest pain.

So these Cammer/Krogman factors, such as, is it a large company stock, is it followed by many analysts, there's a huge overlap in these factors. They are basically concentric circles or almost concentric circles of more or less the same thing, actively traded, large stock that's followed actively.

It is a good indicator of market efficiency. It should be looked at. But it is not a proof of market efficiency, especially in a context like this.

In a context like this, if the court were to say, "The market for Freddie Mac stock was efficient throughout the class period," what that means is every material disclosure defect that is alleged is presumed to have distorted the stock price during the class period.

You can't test for that presumption just by Cammer/Krogman factors, just like you can't say vital signs of a patient are indicative that the patient has no disease, period.

You have to vigorously test for market efficiency during the class period in order to be able to show that the market was, in fact, semi-strong form efficient throughout the class period, which is the passage in the complaint that you read to me.

Q. Is there any support for your view that the Cammer/Krogman structural factors cannot reliably detect lack of market efficiency?

A. Yes. I cited to several authorities in my paper.

First of all, Cammer/Krogman factors have never been the way economists test for market efficiency. There have been a handful of economic studies, because in this litigation context, people talk about Cammer/Krogman factors, where these studies examined are these factors, in fact, able to prove, in fact, that the market is efficient.

And the research shows Cammer/Krogman factors can't even distinguish between stocks that are not even weak form efficient, which is a lower standard than what is needed here.

In fact, I have shown in my research, which I've also cited in my report, showing cases where published research in academic journals that was peer reviewed demonstrated that a stock was trading in an inefficient market. Cammer/Krogman factors would pass even for that. It's like pulse. It's almost always there. Every healthy -- every

healthy person has a pulse, but that doesn't mean everybody with pulse is healthy. That's not a test of market efficiency.

Q. If I refer to some of the Cammer and Krogman factors as structural factors, will you know what I'm referring to?

A. Yes. And that's a good term, by the way, because these factors have to do with what the structure of the market is like, is that generally conducive to market becoming informationally efficient, it's not a test of whether the market is, in fact, efficient.

Q. Now, in this case, what test, if any, did Dr. Feinstein conduct in an effort to examine Cammer factor 5, the empirical factor?

A. He claimed that he did an event study and a so-called Z-test.

Q. And what exactly is an event study?

A. Well, an event study is a statistical examination of whether unexpected material news results in contemporaneous significant change in stock price.

Q. Now, how do economists typically use event studies to test market efficiency in securities litigation?

A. Well, when the analysis is done correctly, they start with a hypothesis of which events are material; therefore, are anticipated to result in an effect that can be associated with this cause.

So identifying expected material events comes first. Then you'll study the stock price change through statistical analysis. You identify how much of this change is due to market-wide factors. What remains is a measure of how the stock price changed in reaction to the event you are testing, and if that reaction is with sufficient degree of certitude, i.e., statistically significant, then you conclude this event did result in significant impact on the stock price the way it was hypothesized to.

Q. How many events do economists need to test to assess market efficiency?

A. Well, they should test all material events throughout the class period, because the presumption plaintiffs are seeking here is that the market was efficient throughout the class period.

Q. Let me pose a hypothetical: Suppose you test multiple news dates throughout a class period. What percentage of those days need to show statistically significant abnormal returns for an economist to conclude that a market is efficient?

A. Such an experiment has no implication for market efficiency whatsoever. Again, with your permission, I can elaborate through an example.

Q. Sure.

A. So let's say you gave me ten event dates and you said,

"On five of these event dates, the market price reacted significantly." You'd say, "Is 50 percent more than what may happen on non-news dates," which give or take is usually around 5 percent by the construction of the statistical tests underlying event studies.

I would tell you there is no implication. If, of the ten days that you tested, five were material and five were not, and you observed statistically significant price impact on five non-material dates, and no impact on any of the material dates, obviously this evidence says that the market was not efficient.

If, on the other hand, the five days when the market reacted were, in fact, the material news dates and others were not, then this evidence would support market efficiency.

And if two of the five days were material dates and three were not, then I'd say the evidence doesn't support that the market was efficient throughout the period in those ten days.

Q. What is the role of statistical significance in event studies?

A. It is absolutely necessary for event study to be scientifically valid.

Q. How do you determine what is material information for purposes of an event study?

A. You do that based on economic theory and reasoning before you look at the stock price reaction.

Q. What is "peek-ahead bias"?

A. Well, peek-ahead bias is when you look at the results before you conduct your analysis. Because then the analysis has no scientific validity whatsoever. You already knew the results. All you did is you fit on the result a cause and said, "This is cause and effect." It isn't.

Q. Allow me to pose another hypothetical: Assume a company operates one factory. Assume the factory burns to the ground on the last day of a proposed class period and the stock price moves in a statistically significant manner.

Can you conclude from that event that the market for that stock was efficient over the course of the class period?

A. Well, if the class period is 330 days long, just as in this case, then you can see nothing by observing that on a day the stock went down due to catastrophic event, it means anything about whether the stock was correctly priced on 329 days before that event or not.

MR. FRANK: Your Honor, at this time I'd like to put on the screen if possible our first demonstrative exhibit, D1. Thank you.

BY MR. FRANK:

Q. Dr. Bajaj, can you see Demonstrative Exhibit D1?

A. Yes, I can, Counsel.
Q. What does D1 represent?
A. So D1 is simply plot of, a graph of Freddie Mac's stock price over the class period at issue. And you will see some orange diamonds throughout this period. I can tell you there are 23 of them. They represent the dates that the plaintiffs have alleged were material misstatement dates.
And the last of these diamonds is on November 20, 2007. On that day, of course, the stock dropped, as we heard, 29 percent when Freddie Mac announced catastrophically negative news.
Q. Did you review Dr. Feinstein's single date event study?
A. Yes, I did.
Q. And did you form an opinion regarding whether that study was based on sufficient data?
A. Yes.
Q. What was your opinion?
A. It was not based on sufficient data.
Q. What is the basis for that opinion?
A. Because it tested one day out of a 330-day class period, over which period of time market conditions changed, a lot happened in the company. How could you conclude anything about 329 preceding dates?
Q. Is a single date event study a reliable method to assess market efficiency over a 330-day class period?

A. It is not.

Q. What about if you combine it with the structural Cammer/Krogman factors, is it then a reliable method to assess market efficiency over a 330-day trading day class period?

A. No, it is not, because Cammer/Krogman factors are simply, as I said before, structural factors that in some sense indicate market efficiency, they don't prove market efficiency.

Q. You understand that Dr. Feinstein chose to test November 20th, right?

A. Yes.

Q. Do you have a view as to whether that was an appropriate date to choose?

A. Yes.

Q. And what's your view?

A. It is not.

Q. Why not?

A. Because the first thing I noticed when I read the complaint is the plaintiffs have alleged right in the complaint that on November 20th, Freddie Mac stock price dropped by 29 percent, and that's the last day of their class period.

You don't need to run an event study to know that that date will be statistically significant. Any kind of an

event study you can construct, it has to find that date to be statistically significant. So we've learned nothing new beyond what's alleged in the complaint. Just because you ran a regression model, it doesn't prove anything.

14:26:25 **Q.** Is the testing of one date to assess market efficiency over a lengthy period of time a method that has been tested by economists?

A. Well, economists have commented on that method and said it is not appropriate, whether it's one day or even a 14:26:42 handful of dates. The FDT article that we talked about this morning, or rather you talked about this morning, actually came because in a proceeding like this, one of the plaintiff's experts chose to satisfy the event study prong of market efficiency test by pointing to a handful of days 14:27:04 and showing that the stock price reacted significantly.

One of the authors of FDT, the F of FDT, Fred Dunbar, was the defendant's expert in that case. That case was Polymedica. And based on his testimony, the court found, and then the authors wrote an article saying, proof by 14:27:27 example doesn't work. Even a handful of dates don't work. You have to show consistently that the market reacts to news.

And that was actually the genesis of the FDT paper. And if you read it, Your Honor, you'll find many statements 14:27:42 to that effect. And the paper specifically admonishes that

you should not include the allegation-related dates, and certainly the last day of the class period, in any kind of a test of cause and effect.

Q. Dr. Bajaj, is the method of testing a single date to assess market efficiency over a 330-day trading day class period a method that's generally accepted by economists?

A. No.

Q. Is there a known rate of error for this method?

A. No.

Q. Has it been subjected to peer review and publication?

A. No.

Q. In your opinion, did Dr. Feinstein reliably apply his single date event study to the facts of this case?

A. No, he did not.

Q. Why not?

A. Because the facts of this case are, you knew the result before you even got started. You knew that from reviewing the complaint. You knew that from reviewing Dr. Hallman's report and my report. So there is no new information you have tested. It's just not a valid test.

Q. What is a Z-test?

A. So Z-test was from the authors of the FDT article. Now, Z-test has been around for decades, Your Honor, in statistics. It's a statistical test that says whether one proportion is different from another proportion when you

have two samples.

So, for example, if I wanted to test the hypothesis whether men are more likely to watch Monday Night Football, I could look at proportion of men that watch Monday Night Football, compare that to proportion of women that watch Monday Night Football, and I will put that into this black box called Z-test and it will tell me whether the proportion is statistically significantly different or not.

That's all Z-test is. It is not a test that other than non-peer-reviewed FDT article has ever been used in any peer-reviewed economics or finance journal to test for market efficiency.

And when we talk about Z-test, I would have further insights as to why it's not a valid test.

Q. Well, tell me, why do you believe a Z-test is not a valid test to test market efficiency?

A. So Fred Dunbar testified when you have a handful of dates, proof by example is not sufficient to prove that the market is efficient.

And as a polar opposite, he said, "Well, one thing you could do is look at all the news dates throughout the class period, see what proportion of those news dates produce a statistically significant impact, and then compare that to what proportion of non-news dates have a statistically significant impact."

And as a foundational matter, and they say it in their paper, as a foundational test, this is a foundational test, that may be somewhat informative, just like Cammer/Krogman factors are informative, that maybe further examination will show market efficiency.

14:31:04

Where these authors went wrong, Your Honor, is they compared whether the fraction of non-news dates that show statistically significant impact is lower than fraction of news dates.

14:31:20

And if you are using 95 percent standard of significance, which both Dr. Feinstein and I use, in your event study, 5 percent of the dates, regardless of whether they are news dates or non-news dates, are expected to be statistically significant. That's by construction.

14:31:39

So the fact that on 100 news dates, 200 news dates in the FDT sample, if I recall correctly they had over 200 news dates and over 500 non-news dates, it's interesting that on these 200 news dates, the proportion of significant reaction is more than 5 percent statistically significant according to Z-test.

14:32:02

But that says nothing about market efficiency. Market efficiency is whether the market consistently reacts to material news dates.

So if you were going to put a test of market efficiency in Z-test context, what you would do is take all material

14:32:17

news dates and then see what fraction produce statistically significant impact, and then you can test it against the benchmark whether that is consistent. You can see if you observe 80 percent of the news dates react statistically significant to material news, material news dates, you can see whether that 80 percent given the sample size is close enough to 100 percent to pass the consistency test.

Q. Dr. Bajaj, if I can interrupt you for one moment.

A. Yeah.

Q. Let me ask you, you understood that Dr. Feinstein applied a Z-test in this case to attempt to address -- assess market efficiency, right?

A. Yes.

Q. Okay. And do you have an opinion regarding whether Dr. Feinstein's Z-test was based on sufficient data?

A. Yes.

Q. What was your opinion?

A. It was not.

Q. What's the basis for that opinion?

A. He tested 9 dates out of 30 [sic]. And, in fact --

Q. I'm sorry, did you say 9 dates of 30?

A. Nine dates out of 330.

Q. Oh, thank you.

A. And, in fact, the very statistics books that cover Z-test have sample size requirements far in excess of nine

for that test to be valid as a statistical matter, forget about market efficiency.

Q. Dr. Bajaj, before you on the screen is an excerpt of the textbook that Dr. Feinstein cited. Is this one of your sources for concluding that Dr. Feinstein's test violated sample size requirements?

A. Yes.

Q. And do you have an opinion as to whether Dr. Feinstein's test violated the three sample size requirements that are in this rectangle?

A. Yes, it violated all three as you elicited earlier today.

Q. And what is -- I apologize.

Now, are you aware of any authority that allows an economist to somehow cure or excuse violations of sample size requirements in a Z-test?

A. No. This book, I looked at it from cover to cover, it does not say that if you run Z-test on less than 30 sample size, you can do the test that Dr. Feinstein characterized as diagnostic test. Those are totally separate tests. They are not designed for market efficiency. They do nothing to test market efficiency. And they certainly do not cure the problem of unreliability of Z-test done on nine observations. And that's just a statistical matter.

Q. Let me turn your attention to Demonstrative Exhibit D3.

Can you explain to us what Demonstrative Exhibit D3 depicts?

A. So this demonstrative depicts that there was a large change in market-wide volatility on February 27, 2007.

Q. Before you continue, can you explain to me, what is the relevance of market volatility to market efficiency?

A. Yes. So, Your Honor, you've heard a lot about statistically significant result or not. So forget about stock prices and statistics. Let's consider a simple example. If I wanted to test whether on full moon days larger proportion of waves in a body of water are abnormally large, and if I were doing this test for a placid lake, where almost all the waves were less than one foot tall, a one foot high wave may be considered abnormally high, my standard error.

The measurement, the foot ruler through which I determine whether a wave was abnormally high or not is based on how large waves typically are, the volatility in the size of waves. And for a placid lake, that may be less than one foot. One foot may be more than two standard deviations of an, i.e., statistically significant.

Now, if I take the same yardstick of that foot and I go in the middle of a stormy ocean to do the same experiment on the effect of full moon wave -- full moon days, or nights, on size of the waves, I'm going to conclude suspiciously, incorrectly, that almost every wave is abnormally high.

When in a stormy ocean, you need a much bigger yardstick.

So, therefore, statisticians, and this is the statistical part of an event study, use something called a standard error. And if they say Freddie Mac stock price after adjusting for market and industry effect on that day went up by 3 percent, if the standard error of Freddie Mac stock price volatility during that period was 1 percent, then 3 percent is three standard deviations. And that is statistically significant.

But if during that period Freddie Mac stock price was jumping around like my stormy ocean analogy, 3 percent wouldn't be statistically significant.

So when you do an event study and you use a regression model to identify significant dates or not, it's important to pay attention to the macro environment and the background noise or volatility against which you are testing whether that date was significant or not.

And that's why you need to pay attention to what kind of regime you are sampling your event dates from.

Q. Now, what is the relationship -- well, before I go there, do you see there's language on the slide that says, "In my report, I noted that on February 27, 2007: (1) the VIX index and Freddie Mac implied volatility increased, (2) there were a series of market-wide events resulting in a sharp market-wide stock decline (the largest since

9/11/2001) amidst fears of recession, and (3) the use of Dr. Feinstein's Chow test showed a statistically significant break"?

Do you see that language?

A. Yes.

Q. Now, in that language you referred to a "sharp market-wide stock decline," right?

A. Yes.

Q. Did you hear Dr. Feinstein testify during his redirect that that was proof of market efficiency here?

A. I did.

Q. What was your view of that testimony?

A. It's besides the point. Market efficiency and event study and why we are in this courtroom today has to do with whether firm-specific information --

Q. What do you mean by "firm-specific information"?

A. Namely information specific to Freddie Mac that is unexpected and material can be assumed to have affected Freddie Mac stock price. So you do event studies on firm-specific information, you control for market-wide drops and market-wide volatility. So he had it backwards, I think.

Q. Well, so if market-wide, the entire market of all stocks in the country exhibit efficiency, what impact does that have on whether Freddie Mac's stock price was

efficient?

A. So in this particular case, the news really was on February 26, Chairman Greenspan of Federal Reserve said, "Hey, I fear a recession now." And overnight, Chinese market crashed, and the next day, the broad market indices went down by a larger amount than had been the case since 9/11.

And if the market went down by 3 percent and Freddie Mac went down by 3 percent, or 2 percent, or 4 percent, that says nothing about market efficiency.

Q. Dr. Bajaj, what is "data snooping"?

A. Data snooping is when you look at the data, you see one set of results and then you say, "Let me look at this data a different way," and you keep doing that unless you -- until you find results that you say, "Wow, how surprising, these are significant results."

Q. Did you engage in data snooping in this case?

A. Absolutely not. I did not. I would not do that ever.

Q. How did you discover this February structural break that's depicted on Demonstrative Exhibit D3?

A. So Professor Feinstein in his report, if I recall correctly, had an opinion that on February 27, Freddie Mac stock price changed statistically significantly. And I was obviously interested whether his measure of statistical significance, like I gave an analogy before, was using the

right yardstick, did he use a ruler to measure, what should be measured by a yardstick.

And since he said he looked at all the information throughout the class period carefully to look for material dates, I looked at his own news story, and I looked at these stories that are cited in my report and on this slide, and it was clear to me, you should adjust your yardstick for evaluating statistical significance of events after February 27th.

14:42:36 **Q.** Now, why didn't you find this when you were analyzing Dr. Hallman's report in the year 2012?

A. Because Dr. Hallman had no statistically significant date prior to August of 2007, so I had no reason to examine whether or not he was using faulty yardstick to erroneously conclude a date to be significant when it was not.

Q. Well, are you aware that Dr. Feinstein has accused you of having stated the opposite at a deposition five years ago in this case?

A. Yes, I heard that.

14:43:16 **Q.** Let me draw your attention to Demonstrative Exhibit D6. What does Demonstrative Exhibit D6 show?

A. It shows that what I testified to in 2012 or '13, whenever it was, was absolutely correct. What I said in that case was Dr. Hallman used one year prior to the beginning of the class period, Your Honor, to fit his

regression model in event study. So he used the period indicated in the first bar, August 1, 2005 to August 1, 2006. The average volatility of Freddie Mac stock during that period was 1.16 percent.

14:43:58 And when I suspected something was wrong with his August date, I compared that to Freddie Mac stock price volatility August 1, 2006, which is the start of the class period, till August 8, 2007. And I testified they are virtually identical, and they are.

14:44:19 **Q.** Now, let me draw your attention back to Exhibit D3.

Did you hear Dr. Feinstein testify earlier that this is somehow misleading because you had a graph earlier that showed much smaller differences in the February time period, around the February structural break?

14:44:41 Do you recall that?

A. Yes, I do.

Q. What is your view of that testimony?

A. So I'll leave aside the ad hominems.

But, Your Honor, what happened in the marketplace, if 14:44:51 we remember to the bad days of mortgage and market crisis, is things got topsy-turvy in February. Market volatilities jumped. Then in August, they jumped even more. And then nobody, or most people didn't anticipate, of course, by the time you got to September 2008, our economy almost 14:45:20 collapsed.

14:45:42

So if you are showing that entire period on one chart, and you're not doing a mile-long chart, the only way you can fit September 2008 on that chart is the scale will be very compressed, and it will tend to visually impair the clear break when you look at this data on the date that you went -- on the narrow date range that you are focusing on.

So, yes, scale has something to do with it, but it is not misleading at all.

Q. Dr. Bajaj, what is the impact of the February structural break on Dr. Feinstein's Z-test results?

14:46:00

A. So if you take out the last day of the class period, which FTD authors clearly say it should not be part of it, it should not be because of further reasons we've discussed, and you simply correct for the structural break, his Z-test results are statistically insignificant.

14:46:23

Q. Now, what are the effects of your structural break on Dr. Feinstein's so-called three diagnostic tests?

A. So they fail even if you let the last day of the class period in.

14:46:43

Q. Please turn your attention to Demonstrative Exhibit D8. What does Demonstrative Exhibit D8 show?

A. So the first column, which shows three cells that have "Insignificant" in it, Your Honor, runs Dr. Feinstein's three so-called diagnostic tests in a regression model that corrects for February 27 structural break as well as August

14:47:07

8 structural break. And all of them are insignificant.

The right column says, but that's giving too much credit to these tests, because the last day of class period shouldn't be here. And, of course, that doesn't help the matters, all his purported diagnostic tests remain insignificant.

Q. Dr. Bajaj --

THE COURT: Doctor --

May I ask the doctor a question?

MR. FRANK: Please.

THE COURT: You and Mr. Frank used the term "structural break." In your testimony you use it relative to February 27th and again August 8th.

What do you mean by that term, as precisely as you can tell me?

THE WITNESS: Yes, Your Honor. So remember our discussion a little while ago whether a date is significant or not?

THE COURT: Certainly.

THE WITNESS: It's judged based on what is called a standard error, which says what's the level of bad ground volatility relative to which you measure whether the price reaction was large enough to be considered significant or not.

So what happens is --

BY MR. FRANK:

Q. Dr. Bajaj, can you explain a structural break using an analogy?

A. Yes. So if you have -- if you've determined that your yardstick in the Pacific Ocean to measure large waves is three feet, and then you go into part of Pacific Ocean where there's Category 4 hurricane, that yardstick ain't going to be correct, right?

So what you do -- what you -- what you determine, when there is a structural break, if your empirical relationship that is the basis for you identifying whether a certain date is statistically significant or not has changed, you need a different yardstick.

So in this context, if background volatility jumped starting February 27 and remained elevated relative to prior period in the class period until August 8th and then it jumped again, you need three different standard errors to evaluate whether an event is significant or not.

A lower standard error for first part of the class period, adjusted and higher standard error for the second part, and adjusted again and even higher standard error for the last part of the class period.

And when you make those changes, several of the four dates that he said were statistically significant, in fact two of the four, are not statistically significant. The two

that remain significant, one of the two is the last day of the class period.

And when you apply his Z-test or his diagnostic test to this evidence, it shows no statistical difference relative to his purported non-news dates.

So on his own terms, he could not conclude market efficiency, and he so testified in the hypothetical, Your Honor.

Q. Dr. Bajaj, when you use the analogy to the ocean and choppy water versus a placid lake or a Category 5 hurricane, what are you trying to measure that is analogous to market efficiency?

A. You are trying to measure when there is a material event, did the stock price change by an amount that's large enough relative to the background volatility for you to be able to say with statistical certitude, yes, this was a statistically significant reaction to the material news.

Q. What does Exhibit D9 depict?

A. So this is one of the other errors in Professor Feinstein's Z-test, Your Honor, that is analogous and related. So he compares proportion of significant dates on a small sample of nine observations with a much larger sample of 321 observations. And the Z-test for proportions says the standard error of the proportion that you are measuring is relative to how large your sample is.

And then you have such a, quote, unquote, "unbalanced sample" with nine dates, whether the observed proportion is by itself significant or not should be measured using 16.6 percent as the measure of your standard error.

In other words, if you have two proportions which are less than 32 percent different, then they are not two standard errors different and, hence, not significantly different.

Whereas the 321-date sample, because that's a larger sample, has much lower standard error -- if you go back to that slide just for a second.

The standard error difference is over 12 times, Your Honor. And his Z-test, what he did, he took the average of these two standard errors by pooling them to measure statistical significance. That overstates the significant measuring stick, or yardstick of this type of stick, it roughly doubles it. And that's another error in his test.

Q. Dr. Bajaj, what does Demonstrative Exhibit D10 depict?

A. So this shows the six dates that Dr. Hallman had tested, and Dr. Feinstein reviewed that report, of course.

Q. And what's the difference between the green and the red on this slide, the green circles and the red circles?

A. The red circles mark the dates that Dr. Hallman claimed were statistically significant. There was only one, except for the last date, which is purple. Because that's not a

proper date, I did not want to mark it red.

So other than the last date, Dr. Hallman had found only one statistically significant date out of six he chose to test, which was August 30th.

14:53:39 **Q.** And what does Demonstrative Exhibit D11 depict?

A. So it shows you, regardless of how he selected them, the dates that Dr. Feinstein looked at, nine dates. There is not a single date he tested during the first 43 percent of the class period, Your Honor.

14:53:58 He tested nine dates. He found three of them significant, which are in the red circles, F1, F2 and F6. F1 and F2, once you account for the structural break in February, which is right around here, F1 is actually February 27th, F1 and F2 are no longer significant.

14:54:18 **Q.** But, Dr. Bajaj, let me interrupt you for one moment. How many red circles do you see on D11?

A. Four.

Q. Okay. And four are the statistically significant dates according to Dr. Feinstein?

14:54:30 **A.** Yes.

Q. Okay. And he tested a total of how many dates?

A. Nine.

Q. Okay. Now let's take a look at Demonstrative Exhibit D12, if I can get there. D12. Okay.

14:54:43 Now, what does Demonstrative Exhibit D12 depict?

A. I apologize for running ahead of myself a little. I get excited sometimes, Your Honor.
Q. That's all right.
What does this slide show?
14:54:55 **A.** This slide shows what I was saying a little earlier. Once you correct for February 27 structural break, which according to the statistical test he himself used, he can't say was not significant, F1 and F2 are no longer statistically significant. They were significant because he
14:55:12 was using the wrong yardstick, Your Honor.
The only two dates that remain significant are August 30th and the last day of the class period, exactly what Dr. Hallman claimed.
Q. Dr. Bajaj, did you reach -- do you have a view as to
14:55:30 whether a Z-test is a reliable way to test for market efficiency?
A. It is not.
Q. What is that view?
A. Z-test has never been used in any peer-reviewed
14:55:41 economics or finance journal to test market efficiency. It is not the right test for various reasons we've been discussing.
Q. Do you have a view as to whether or not Dr. Feinstein reliably applied his Z-test to the facts of this case?
14:55:55 **A.** He did not.

Q. Why do you say that?

A. Because he had a handful of days. There are a lot of problems with his selection of those dates, as you were pointing out during your cross-examination, and the last day of the class period shouldn't have been in his dates. In fact, none of the allegation-related dates, according to FDT authors, should have been part of that test.

Q. You testified earlier as to the meaning of peek-ahead bias. What, if any, relevance does peek-ahead bias have to Dr. Feinstein's selection of dates for his Z-test?

A. It is actually very pernicious.

So, Your Honor, it is true, especially in the old days when people used to do event studies around evident changes or earnings announcements, the way you identify those dates, I used to do that myself in my published research, Your Honor, you went through big, thick volumes of Wall Street Journal index and looked for all the earnings announcement dates, and once you had identified those dates, then you did your event study.

So Wall Street Journal has been used to identify dates lots of times in peer-reviewed articles. Dr. Feinstein is correct about that.

I don't recall seeing many New York Times, because New York Times is not primarily a business paper, it's focused on New York area, but it does have a business section, but I

could see somebody using a screen of looking at dates that were covered by New York Times.

But when he imposed his selection criteria, he added two elements that biased hopelessly his conclusions and made them scientifically invalid.

First, he said an event has to be in both papers. Now, Wall Street Journal routinely covers earnings dates, and I think Mr. Frank showed evidence to Dr. Feinstein that all six of Dr. Hallman's earnings dates were covered in Wall Street Journal. New York Times covers those stories which are unusual. And, in part, how they determine unusual is how did the market react to it. These are both ex-post, right? Story appears after something else happened. That's how journalists know.

So if Wall Street Journal is going to say it, "Freddie Mac announced earnings today," they do that routinely, there's no bias in identifying dates that way. But if Wall Street Journal writes a special article devoting their sparse column space to writing a story about Freddie Mac, chances are the market went nuts that day, that's why they wrote a special article with "Freddie Mac" in the headline.

And then on top of that, you say the date must be covered also by New York Times? That only compounds this error. In event study, you first identify dates and then you test them. If your identification method is ex-post,

namely something big happened, that's why you observe both New York Times and Wall Street Journal writing big stories about it, you've already selected a biased sample.

Not only that, FDT paper says don't pick any dates, even without this two paper criteria, which they don't use, if the story itself mentions the stock price. For the same reason, if the story is written to mention the stock price, they're not going to write a story, "Freddie Mac announced earnings and there was nothing that happened to stock price." They are more likely to write that story if something happens. So they say, "Don't pick such dates."

And both August 30th and November 30th, the articles Dr. Feinstein has put in his exhibit that led him to pick these dates, the articles in one or both of these papers actually discuss the price reaction.

So, once again, he picked the last day of the class period that the plaintiffs already told the whole world the price dropped by 29 percent. The nine dates he selected had this, I would say, inadvertent, but nevertheless important, peek-ahead bias, so the result is not reliable.

Q. Dr. Bajaj --

THE COURT: Mr. Markovits?

MR. MARKOVITS: Excuse me. I just wanted to notify Mr. Frank and the court, we're about 65 minutes already.

MR. FRANK: I have one question if I do it correctly, two if I do it incorrectly.

THE COURT: All right, then. Keep track, Mr. Markovits, in the event I need to distribute more time to you for cross. Thank you for letting me know.

Mr. Frank?

MR. FRANK: Thank you.

BY MR. FRANK:

Q. Dr. Bajaj, ultimately you've drafted two reports in this case and have concluded that both Dr. Hallman and Dr. Feinstein both failed to establish through an empirical test that the market for Freddie Mac stock was efficient.

Are you surprised that -- are you surprised by the fact that two economists tried to empirically test the cause and effect relationship and were unable to show it?

A. No, I'm not surprised at all.

Q. Why not?

A. Well, the reason is, as Dr. Feinstein testified, I think including today, this was a very unusual, tumultuous period. During this period, we started what became the Great Recession, which was worldwide. And the center of that recession was the mortgage market. And at the center of the mortgage market was Freddie Mac.

So in this tumultuous period, one of the things that happened was there was systemic liquidity crisis.

Arbitrageurs that we talked about that keep markets efficient, I cited in my report articles how arbitrageurs couldn't afford to trade because they couldn't get credit and their investors were getting impatient and withdrawing their money. So arbitrage activity, which is the lifeblood of market efficiency, was severely constrained.

And, as Dr. Feinstein testified in his deposition, there were also severe market dislocations, such as tremendous violation of put-call parity, such as higher rated bonds selling for lower priced and lower-rated bonds as people tried to raise money somehow by selling the only bonds that are liquid, which are the higher-rated bonds.

Prices became dislocated. And when prices become dislocated, and I picked that up in put-call parity test that we talked about, it indicates market is not functioning. Put-call parity tests failing means two sets of prices that should be in alignment are not.

What does that mean? Either the option prices are incorrect or stock prices are incorrect or they are both incorrect. Two out of three indicate stock prices might be incorrect. It is an important evidence of market dislocation.

It is not surprising that during this period, despite two attempts, both the economists failed to prove semi-strong form of informational market efficiency.

MR. FRANK: Your Honor, I pass the witness. Thank you.

THE COURT: Thank you. Dr. Bajaj is passed for cross-examination.

15:04:11 MR. MARKOVITS: That may be the only time when a lawyer said one more question and actually asked one more question.

CROSS-EXAMINATION OF MUKESH BAJAJ, Ph.D.

BY MR. MARKOVITS:

15:04:25 **Q.** Good afternoon, Dr. Bajaj.

A. Good afternoon, Counsel.

Q. Good to see you again.

A. Yes, we've been meeting for several years now.

Q. For several years.

15:04:39 Dr. Bajaj, your opinion is that in order to prove that a plaintiff is entitled to a presumption of reliance under the fraud-on-the-market theory, plaintiff must show that the stock traded on a semi-strong form of efficient market during the class period?

15:04:57 **A.** Yes. And for clarification, in the informational sense.

Q. You're familiar that the fraud on the market presumption reliance was established in the Supreme Court case of Basic v. Levinson?

15:05:10 **A.** Yes.

15:05:25
15:05:45
15:05:55
15:06:11
15:06:28

Q. And you would agree that the Supreme Court in Basic didn't clarify what constituted adequate proof of efficiency for reliance purposes?

A. No, I can't agree with that. I thought it was clear, but I'm not a lawyer. If you say it was not sufficient clarification, you can make that legal argument.

MR. MARKOVITS: Could you put up slide 11, please?

MR. LEWIS: Sure. There you go. It's coming. He's got to bring it up.

BY MR. MARKOVITS:

Q. Dr. Bajaj, you wrote an article along with a couple of others called "Assessing Market Efficiency."

Do you recall that?

A. Yes.

Q. And do you recall in that article stating, "Basic did not clarify what constituted adequate proof of efficiency for reliance purposes"?

A. Yes. I was referring to the methodology; namely, it didn't say you test Cammer/Krogman factors, et cetera, et cetera. That came through later case law.

Q. So, again, getting back to my question, you would agree the Supreme Court in Basic did not clarify what constituted adequate proof of efficiency for reliance purposes?

A. In that sense of methodology, correct, it did not specify the methodology needed to test for market efficiency

for reliance purposes.

Q. You'd agree that markets respond relatively promptly to material information?

A. If they are efficient, they should.

15:06:44 **Q.** Currently, New York State -- New York Stock Exchange, would you agree that in that exchange, the market typically responds reasonably promptly to material information?

A. In the same way that I would say 15-year-olds are generally more healthy than 85-year-olds -- I have both in

15:07:15 my family -- yes.

Q. Can you just answer -- possibly, maybe the answer is no, but can you answer yes or no, markets typically respond reasonably promptly to material information?

MR. FRANK: Objection.

15:07:30 THE WITNESS: In a general sense, the way I explained, yes.

THE COURT: That objection is overruled. If another objection comes, do it standing, but it wouldn't have changed the ruling then. All right?

15:07:43 MR. FRANK: Thank you, Your Honor. Thank you, Your Honor.

THE COURT: Certainly.

BY MR. MARKOVITS:

Q. You're familiar with the amicus brief filed by the

15:07:54 financial economists in Halliburton II?

A. I've read it, yes. I'm not an authority on it, but I've read it.

Q. And you're aware that that brief includes as signatories both Eugene Fama and Robert Shiller?

15:08:11 **A.** Yes.

MR. MARKOVITS: Your Honor, may I approach?

THE COURT: You may.

BY MR. MARKOVITS:

Q. Dr. Bajaj, I'm holding -- I'm showing you what's been

15:08:21 marked as Plaintiffs' 4 --

THE COURT: Thank you.

BY MR. MARKOVITS:

Q. -- which is a copy of the brief of financial economists as amici curiae in support of respondents in the Halliburton

15:08:35 II case.

And if you turn to small Roman -- I'm sorry. If you turn to pages 1 and 2, you'll see that the amici include Eugene Fama and Robert Shiller.

A. Yes.

15:08:57 **Q.** And Eugene Fama is considered the father of the efficient market hypothesis, correct?

A. Yes.

Q. And Robert Shiller is one of his harshest critics; would that be fair?

15:09:12 **A.** I think he is respectful and appreciates Professor

Fama's work and generally agrees with it, except he's pointed out further evidence of why markets are not always efficient.

Q. And you've read over this brief, and you know that the brief recognized that debates among economists about the degree to which a price of a company stock reflects public information, that there were these debates about -- among economists about the degree to which the price of a company stock reflect public information about a company, correct?

A. Where are you reading from, Counsel?

Q. I'm sorry. If you go to the top of page 6, it says, "Professional economists have debated for decades the extent to which the securities markets actually conform to the SSEMH."

Do you see that?

A. Yes.

Q. Okay. And what does SSEMH refer to?

A. Semi-strong form of efficient market hypothesis, I'm pretty sure.

Q. Do you recall reading -- if you turn back to page 4, and the first full paragraph, second sentence, it says, "The ECMH entails a great deal more than the modest proposition that markets typically respond reasonably promptly to material information."

Do you see that?

15:10:56

15:11:17

15:11:43

15:11:54

15:12:05

A. Yes, I do.

Q. And do you see where it says, "That much is generally viewed as common ground among contemporary economists"?

Do you see that next sentence?

A. Correct, I do.

Q. Would you agree that the modest proposition that markets typically respond reasonably promptly to material information is common ground among contemporary economists?

A. Yes. In that context, what they are saying is markets that are not even -- that may not be fundamentally efficient may still be informationally efficient; and when they are efficient, then the definition of informational form of semi-strong form of efficient market hypothesis is that the markets promptly react in the correct direction through material new information.

Q. And I believe my question was, you would agree that there's common ground among contemporary economists that markets typically respond reasonably promptly to material information?

A. With the clarification that I provided, yes. In that context, that's true.

THE COURT: Mr. Markovits?

MR. MARKOVITS: Yes.

THE COURT: I'd like to be clear on what ECMH means.

BY MR. MARKOVITS:

Q. Yes. Could you inform the court, please?

A. Yes, Your Honor. ECMH is an acronym for efficient -- I know EMH should mean efficient market hypothesis.

Q. Is it the efficient --

MR. FRANK: Your Honor, it's -- yeah, I'm sorry.

BY MR. MARKOVITS:

Q. -- efficient capital market hypothesis?

A. Efficient capital market hypothesis. Thank you. I was --

THE COURT: Thank you all.

THE WITNESS: -- missing that.

BY MR. MARKOVITS:

Q. The modest premise -- I'm sorry.

The modest proposition here is that markets typically respond reasonably promptly?

A. Counsel, the proposition here is not a statement of fact that all markets, all securities within the markets always do this. What they are saying is economists have debated a lot about presence of bubbles, whether the market prices reflect fundamentals properly or not, can there be market inefficiency that's prolonged and systemic, was the Japanese stock market overpriced in the '80s.

All that debate has developed since Fama came up with his efficient market hypothesis.

But a more modest way, more -- what is the word you used?

Q. Modest proposition. Excuse me. Excuse me.

A. -- modest proposition is generally true of efficient markets that even if they are not fundamentally efficient, they, when efficient, react to material news.

They are not saying, "We've tested for all stocks for all times and we can say all economists agree that all stocks at all times trade in an informationally efficient market according to this modest premise." That's, of course, not true.

THE COURT: Why don't you stop there, because I think Mr. Markovits is trying to direct you further.

MR. MARKOVITS: I am.

THE COURT: Thank you.

BY MR. MARKOVITS:

Q. Dr. Bajaj, as you know, I'm on the clock.

A. Sorry.

Q. So when I ask a yes or no question, if you could possibly give a yes or no answer, that would speed things along.

A. I will definitely try, Counsel.

Q. All right. Thank you.

Dr. Bajaj, you read the Supreme Court opinion in Halliburton II?

A. Yes, I did.

Q. Was it your impression that the Supreme Court, in large part, agreed with the amicus brief of the financial economists?

A. They drew upon the distinction between fundamental and informational economists to clarify that Basic was never about fundamental efficiency, it was always about this more modest premise of informational efficiency. That was my reading.

MR. MARKOVITS: All right. Could you put up slide 12, please?

BY MR. MARKOVITS:

Q. Doctor, if you'd look at the screen, slide 12 has a quote from Halliburton that says, "The academic debates discussed by Halliburton have not refuted the modest premise underlying the presumption of reliance. Even the foremost critics of the efficiency-capital-markets hypothesis acknowledge that public information generally affects stock prices."

Would you agree with that last statement, that "Even the foremost critics of the efficiency-capital-markets hypothesis acknowledge that public information generally affects stock prices"?

A. Yes, generally that is true. I agree with that.

Q. Thank you.

And the Supreme Court said that debates about the degree to which stock prices accurately reflect public information are largely beside the point, didn't they?

A. I think that's how they interpreted Basic. That was always the premise behind fraud-on-the-market theory.

Q. And I want to turn back to the brief of the financial economists. And if you could look at page 5, second paragraph.

MR. MARKOVITS: Kevin, it's slide 14, I believe.

BY MR. MARKOVITS:

Q. And this is important. I want to focus on this, if you will, what's on the screen, from the brief of the financial economists. It says, "The key point for present purposes is that while the proposition that market prices respond relatively promptly to material information about a stock is true if the SSEMH is true, it does not depend on the SSEMH being true."

Did I read that correctly?

A. You did.

Q. And SSEMH is a semi-strong efficient market hypothesis, correct?

A. Yes. And they're referring to the fundamental form of SSEMH, that even if that is not true, informational form of SSEMH may still be true. That's my reading of it.

Q. Excuse me. That's your reading. It doesn't say that

there, does it? It just says you don't have to have a semi-strong efficient market in order for prices to respond relatively promptly to material information; isn't that a fair reading of that sentence?

15:17:34 **A.** It is a reading, but it's not a fair reading. If you wish the court to hear my economic reading of this, I'm doing my best, trying to be brief.

Q. Now, thank you, Doctor. I'll let the words speak for themselves.

15:17:49 **A.** Thank you.

Q. That's fine.

A. Thank you.

Q. Your opinion in this case regarding market efficiency is based in part upon your belief that proof of Cammer 5

15:18:04 factor is necessary to show market efficiency, correct?

A. It is indeed true according to my belief and that of many others, yes.

Q. Let's stick to your belief.

A. Okay.

15:18:16 **Q.** You believe that Cammer 5 is necessary to show market efficiency?

A. For reliance purposes, yes; correct.

Q. All right. And your opinion is that to satisfy Cammer factor 5, an event study must be performed?

15:18:34 **A.** Yes.

Q. Without an event study demonstrating cause and effect, your opinion is there can be no finding of market efficiency?

A. Well, there can always be a finding, but on economic evidence, I would not say that that would be sufficient proof of market efficiency, leaving aside whatever other set of factors some courts may or may not take into account to reach a particular finding.

Q. Let me add a word and see if I can get a yes or no answer.

Without an event study demonstrating cause and effect, your opinion is that there can be no valid finding of market efficiency?

A. Yeah, I would agree.

Q. And your opinion is that the event study should show price reactions to material news at a 95 percent confidence level?

A. Yes.

Q. So in your opinion, even if Professor Feinstein can show all of the other Cammer and Krogman factors were handily met, and that Freddie Mac common stock traded on a national exchange during the class period, this would not be sufficient proof of an efficient market without proof satisfying Cammer factor 5?

A. For purposes of the presumption that is at issue in

this case, yes.

Q. You don't dispute that Freddie Mac traded on the New York Stock Exchange during the class period?

A. No.

Q. You don't dispute that the three Krogman factors, market capitalization, bid-ask spread and float, are met in this case?

A. No, I do not.

Q. And you don't dispute that the first four of the five Cammer factors are met?

A. Again, I don't have them memorized, but if you are referring to structural factors, I have no disagreement that they are met.

Q. Let me put this up for a second for reference purposes.

Can you see that all right, Doctor?

A. I can, yes.

MR. MARKOVITS: Thank you, Kevin.

BY MR. MARKOVITS:

Q. The first Cammer factor is the average weekly trading volume expressed as a percentage of the total outstanding shares, correct?

A. That's what your chart says, and I assume that's correct according to Cammer.

Q. You've applied the Cammer factors before.

A. Yes, but I don't have memorized what is Cammer factor 1

versus 2 versus 3.

Q. You don't disagree with Professor Feinstein's calculation for that factor, Cammer factor 1, of a 3 percent average weekly trading volume?

15:21:36 **A.** I have no reason to disagree with it.

Q. You're aware that the Cammer case itself states that a trading volume over 2 percent creates a strong presumption of market efficiency?

A. According to that factor, yes.

15:21:52 **Q.** But you don't believe that the average weekly trading volume, whether 2 percent or even higher, is probative evidence of market efficiency, correct?

A. It depends on what context we are talking about probative. It's not sufficient evidence, in my opinion, as

15:22:11 we've been discussing.

Q. You don't believe it's probative evidence of market efficiency, correct?

A. It's probative like somebody being 15-year-old is probative of that person being generally in good health.

15:22:26 MR. MARKOVITS: Kevin, could you put up slide 20?

Jason, I'm going to be looking at his January deposition, it's up there, on page 113:18.

BY MR. MARKOVITS:

Q. Do you recall I took your deposition in January of

15:22:43 2013?

15:22:54

15:23:07

15:23:23

15:23:39

15:23:51

A. Not the date, but I do remember we sat down, yes.
Q. As you said, we've known each other a while.
A. Yeah.
Q. This is a portion of the transcript of the deposition. Let me read this, and tell me if I read it correctly. I asked the question: "And would I be correct in assuming that you don't believe that any particular turnover percentage, whether 2 percent or higher, would justify a strong presumption of market efficiency?"

Answer: "Well, I don't know what strong presumption means in a legal decision. But it is not probative evidence, from an economic perspective."

Is that the answer you gave in 2013?
A. I assume it is. I have no reason to disagree with it.
Q. And yet, let's take a look at your report in the Allergan case. In Allergan, you were hired by the plaintiff's counsel to assess market efficiency for the fraud on the market presumption?
A. Yes.
Q. You may have it in front of you.

MR. MARKOVITS: Your Honor, may I approach?

THE COURT: You may.

BY MR. MARKOVITS:
Q. It's been previously marked as Plaintiff's 3. Yes, here you go.

A. Thank you for helping, Counsel.

Q. In Allergan, you were hired by plaintiff counsel to assess market efficiency for the fraud-on-the-market presumption?

A. Yes.

Q. Your report was October 11th, 2016?

A. It appears so, yes.

Q. And if you look, I believe, I'm sorry, at page 7 of 30, under "Summary of opinions."

MR. MARKOVITS: Slide 21, please.

BY MR. MARKOVITS:

Q. Your first opinion was: "The Cammer and Unger factors indicate that Allergan stock traded in an efficient market."

Did I read that correctly?

A. Just one moment.

Yes, you did read it correctly, yes.

Q. The Unger factors referred to are the same as the Krogman factors in this case?

A. I believe so, yes.

Q. Now let's -- since we've been talking about it, let's look how you handled Cammer factor 1, the average weekly trading volume.

Could you turn to paragraph 21?

MR. MARKOVITS: And that's slide 23, Kevin.

THE WITNESS: Okay.

BY MR. MARKOVITS:

Q. You found that the average weekly trading volume for Allergan stock was 5.6 percent?

A. That is correct, yes.

Q. And you stated in your report, this created a strong presumption of market efficiency?

A. Did I say it created a strong presumption? I don't recall saying that.

Q. Well, you're quoting the Cammer court where it says, "turnover measured by average weekly trading of two percent or more of the outstanding shares would justify a strong presumption that the market for the security is an efficient one."

A. So I quoted the court decision. I would never be presumptuous to say that the court speaks for me. So it was not something I offered an opinion, I cited that court decision.

Q. So by quoting the Cammer court there's a strong presumption of market efficiency if the active trading volume was over two percent, you didn't mean to imply to the court, looking at this report, that they should find a strong presumption of market efficiency?

A. No, I simply said that's what Cammer court said, these are one of the factors that are looked at, this is how Cammer court considered it, and this was the number, and it

does indicate market efficiency.

My language in the opinion says, "Allergan stock active trading volume indicates market efficiency." My opinion is not either what you read or hear, it creates a strong presumption of market efficiency by itself.

Q. So you were just quoting the court, but you didn't believe the court?

A. No. Again, Counsel, I don't want to get into any kind of arguments about legal decisions with a learned counsel like yourself.

What I would say is, you know, the court considered several factors. This was the same court that said Cammer factor 5 is the essence of market efficiency. So I'm not here to pick a few words from this legal opinion or that legal opinion and try to interpret it authoritatively. I stated what I stated. I believe it's accurate. I stick by my opinion as it is stated where I stated my opinion, it is an indicative of market efficiency the way I explained.

Sorry for the long answer. I will try my best to keep it as brief as I can without being misleading.

Q. I think you can do better, Doctor, but we'll move on.

A. Thank you for your confidence.

Q. Freddie Mac common stock traded on the New York Stock Exchange during the class period?

A. Yes.

Q. You would agree that large capitalization stocks that trade on a major stock exchange such as the New York Stock Exchange are generally presumed to be efficient unless there is evidence to the contrary?

15:28:10 **A.** Where are you reading from? What are you reading from?

Q. I am reading a question.

You would agree, yes or no, that large capitalization stocks that trade on major stock exchanges such as the New York Stock Exchange are generally presumed to be efficient unless there's evidence to the contrary?

15:28:24

A. I think that would be a fair statement, yes.

Q. I want to turn back to your Allergan report for a second, Plaintiff's 3.

A. Okay.

15:28:41 **Q.** And at paragraph 18 of your report, you begin with the following sentence.

MR. MARKOVITS: Slide 25, Kevin.

MR. LEWIS: Okay.

BY MR. MARKOVITS:

15:28:49 **Q.** And it reads: "Intuitively, for a large capitalization stock like Allergan with many market analysts, high trading volume, active flow of information and listing on a well-developed public exchange such as the New York Stock Exchange (NYSE), it is reasonable to infer that the observed stock prices are determined in an efficient market."

15:29:10

Did I read that correctly?

A. You did.

Q. Okay. Now --

MR. MARKOVITS: Slide 26, Kevin.

BY MR. MARKOVITS:

Q. I want to substitute "Freddie Mac" for "Allergan" in that statement.

Would you agree that intuitively, for a large capitalization stock like Freddie Mac with many market analysts, high trading volume, active flow of information and listing on a well-developed public exchange such as the New York Stock Exchange, it is reasonable to infer that the observed stock prices are determined in an efficient market?

A. If my intuition were enough for purposes of this hearing, Your Honor, then you should certify the class based on these factors.

I have no disagreement with the statement as worded. It's a preliminary statement. Intuitively one thinks of that, just like intuitively you think 15-year-olds are healthy.

Q. All right. You would agree --

A. It's intuitively the case.

Q. You would agree that for a large capitalization stock like Freddie Mac with many market analysts, high trading volume, active flow of information and listing on a

well-developed public exchange such as the New York Stock Exchange, it is reasonable to infer that the observed stock prices are determined in an efficient market?

MR. FRANK: Objection, asked and answered.

15:30:31 THE WITNESS: Yes.

THE COURT: Thank you. Overruled.

BY MR. MARKOVITS:

Q. And, Dr. Bajaj, has your opinion in that regard changed since the last time we spoke?

15:30:43 **A.** No. You know, if you read something to me in my deposition and I didn't know the context where it was coming from, and you read me some language and I reacted to it differently because I interpreted it in certain ways possible, I answered something else.

15:31:02 But my opinion is the same. Intuitively, this makes sense.

Q. All right. Well, let's go to your deposition.

MR. MARKOVITS: Slide 27.

And it's the 9/26 deposition, Jason, at page 176.

15:31:16 BY MR. MARKOVITS:

Q. And I asked you the question: "Would you agree that for a large capitalization stock like Freddie Mac with many market analysts, a high trading volume, active flow of information and a listing on the New York Stock Exchange,

15:31:29 it's reasonable to infer that stock prices are being

determined in an efficient market"?

And you did not agree?

A. No, if you read my answer, what I said, "So I think I expect stocks satisfying those characteristics many times to be trading in an efficient market, but I wouldn't say those factors would obviate the need for direct evidence on market efficiency through Cammer factor 5 analysis."

My opinion has remained consistent whether I was engaged by plaintiff's counsel or defense counsel in 2012 or not.

Q. Let's explore that, because then I go on to ask the same question, and your answer is: "No, I can't say yes to the language that you used in your question." Even though that's the same language you used in a report you authored in 2016; isn't that correct?

A. So you got me there. You didn't tell me where you were reading from. You read some language to me. I interpreted it in a certain way, and I thought it sounds more definitive than I really believe, so I said as worded, I can't agree to it.

I didn't correct that answer because it's correct. If you just state that language in isolation and you imply its importance to be more than it is, then I wouldn't agree to it. I agree --

THE COURT: I think you can stop there.

MR. MARKOVITS: Yes.

THE COURT: I think --

MR. MARKOVITS: We got the point.

THE WITNESS: Okay.

15:33:04 THE COURT: Exactly. Thank you both.

BY MR. MARKOVITS:

Q. Doctor, as we discussed before, your opinion is that proof of Cammer factor 5 is necessary to prove market efficiency and that an event study is necessary to prove

15:33:14 Cammer factor 5, correct?

A. Certainly in a proceeding like this, for purpose like this and circumstances like this, yes.

Q. And you criticize Professor Feinstein for, among other things, using only one date as an event date to test?

15:33:27 **A.** Correct.

Q. And even if he used two dates and found a statistically significant price reaction on those two days, you would say that the most that could prove is that on those two days, there was cause and effect?

15:33:45 **A.** I think that's fair when you're dealing with 330-day class period, that won't be adequate.

Q. I want to be clear. Your opinion is that all that would prove is that on those particular two days, there was cause and effect?

15:34:03 **A.** In a strict sense, yes. Whether it's fair to infer,

suppose the class period was 20 days, Your Honor, and --
Q. Excuse me.
A. I apologize.
Q. Yes or no?
A. Your questions. Your answers.
Q. Thank you, Doctor.
A. Or my answers, but to your questions.
Q. If you'd like, I'll answer the questions.
(Laughter.)
A. I didn't want to give you a freebie in here, Counsel, to write my testimony.
Q. All right. Let's move on from there.
In addition to criticizing Professor Feinstein for using only one date, you also criticize him for using the last day of the class period, correct?
A. Yes.
Q. And your opinion is that it's improper to use the last day of the class period?
A. If it's outcome determinative, yes.
Q. Let's turn back to your Allergan report, Dr. Bajaj.
A. Okay.
Q. And if you could turn to paragraph 53 of your report.
MR. MARKOVITS: And that's slide 22, Kevin.
BY MR. MARKOVITS:
Q. And beginning at page [sic] 53, you talk about the

event study you did in Allergan; is that correct?

A. You said page 53?

Q. I'm sorry, paragraph 53.

A. Paragraph 53, yes.

Q. Page 24 of 30.

A. Yes, that's correct.

Q. And on the slide, if you look at the slide, I've sort of summarized, the class period was February 2nd, 2014 through April 21st, 2014. And the event dates you tested were April 11th, April 21st and April 22nd, correct?

A. Yes.

Q. And so the two dates, April 21st and 22nd, let's start with April 22nd, that was right outside of the class period, correct?

A. Well, it was part of the event on April 21, yes.

Q. Okay. And April 21 was the last day of the class period?

A. Correct.

Q. And then you also tested April 11. You didn't test any dates in the first half of that class period, did you?

A. So you just want me to say yes or no or give any context or not?

Q. I just want you to say yes or no at this point. It would be appreciated.

A. Yes.

Q. You used an event date in the first half of that class period?

A. There was no event date in the first half of that class period.

15:36:43 **Q.** Okay. You tested a handful of dates, two in the class period, or three if you want to count the one outside the class period?

A. Out of 39, yes.

Q. Okay. What peer-reviewed article supports your use of

15:37:07 two event dates during the class period for your event study in Allergan?

A. Well, I'm not sure there is any peer-reviewed article that has been written or should be written saying, in a securities class action case, if you are faced with a

15:37:29 situation with 39-day class period, could you use two dates regardless of specific facts of that case. Peer-reviewed articles are about general principles, general phenomena.

As an expert economist, it's my job to faithfully apply that knowledge to the facts of this case. So, therefore,

15:37:54 there is no such peer-reviewed article that I'm aware of.

Q. All right. So the answer is there is none?

A. Yes.

Q. Is there any peer-reviewed article that would support the use of two event dates regardless of the length of the

15:38:09 class period?

A. I don't know. As I sit here, I can't put my tongue on peer-reviewed articles. I know that in law journals and articles cited by Dr. Feinstein and myself, there is definitely --

15:38:31 **Q.** Limit yourself, please. The question was peer-reviewed articles. That was the question Mr. Frank asked about with Professor Feinstein.

A. Okay, fair.

Q. I'm asking the same question.

15:38:42 Were there peer-reviewed articles that would support your use of two event dates in Allergan or two event dates for a class period of any size?

A. Not in that sense, yes.

Q. What was the standard of control for your event study

15:38:59 in Allergan?

A. Standard of control was 100 percent probability that I tested 100 percent of material dates and found 100 percent of them to be statistically significant. There was no error rate for that event study.

15:39:19 **Q.** There is no error?

A. Absolutely none.

Q. What would the rate of error have been if you had used three dates during the class period, would it have changed at all?

15:39:31 **A.** Well, if you had a Binomial test that said there are

three material dates and you only look at one, what is the probability that extrapolating from that one through three would be done in error, I can't do the calculation in my head, but it would be a very high error rate.

15:39:52 **Q.** So let me ask this way: You're saying there was no rate of error because you appropriately tested three dates and they showed a statistically significant price movement?

A. No, there is no rate of error because I appropriately tested 100 percent of material news dates. That's the reason there is no error.

15:40:08 **Q.** And if Professor Feinstein, by testing the last day of the class period, tested 100 percent of the material news dates, then there would be no rate of error, or 100 percent non-error, in his test as well?

15:40:25 **A.** Not on the facts of the case, because the last date of the class period and its significance was a foregone conclusion.

Q. Just on rate of error. If he's testing -- if he's testing the only material news day and it comes out to be a statistically significant price reaction, then his rate of error is the same as your rate of error in Allergan, isn't it?

15:40:44 **A.** If there was, in fact, only one material date, and he tested that material date scientifically correctly, I would not criticize his event study, period.

15:41:04

15:41:21
15:41:34
15:41:51
15:42:09
15:42:26

Q. And in Allergan, did you prepare that event study solely for the Allergan litigation?

A. Well, that question was asked of me for Allergan litigation, but I didn't design my methodology for Allergan litigation.

Q. Did you apply that methodology and do that event study solely for the Allergan litigation?

A. Anytime I file an expert report in a case, I file it for that case.

Q. Exactly. In doing an event study, you look for material news days; that's correct?

A. Yes.

Q. Your definition of materiality with respect to financial news is information that would be expected to result in a statistically significant stock price change?

A. Expected ex-ante, yes.

Q. Excuse me? I'm sorry.

A. Ex-ante expected, not after looking at the results.

Q. Are you aware of a general legal definition of materiality that talks about a news being material if it would be viewed by the reasonable investor as having altered the mix of information made available?

A. I think we are venturing into a territory where you're giving me more respect as a legal scholar than I deserve. I'm not here to opine on definition of materiality from

legal purposes, but I'll do my best to answer your question. So if you wish to repeat it, with that caveat, I'll do my best.

Q. And I apologize for too much respect.

(Laughter.)

Q. Have you -- have you heard of the following definition of materiality that's sometimes used in the legal context, which is that financial news is material if it would be viewed by a reasonable investor as altering the total mix of information made available?

A. It sounds sort of familiar. I can't tell you whether you read some legal definition correctly or not.

Q. Let me see if I can get you to agree with me on this:

That news that a reasonable investor might view as significantly altering the total mix of information made available would not necessarily be expected to result in a statistically significant price movement; isn't that correct?

A. Now, the answer depends on whether you're doing the examination for establishing market efficiency or having obtained presumption of market efficiency for damage purposes, you're saying if it was materially when if it was not quantitatively material, we have the presumption sanction by this court that it distorted the stock price.

So I think only fair answer to your question would have

to give me more assumptions to be able to distinguish between these two circumstances.

Q. Let's switch topics, Dr. Bajaj, and let's talk a little bit about the Z-test very briefly.

15:44:20 **A.** Okay.

Q. Now, a Z-test is a test of difference of proportions between two samples?

A. Yes.

Q. It's a well known and basic statistical test?

15:44:30 **A.** Yes.

Q. It dates back decades?

A. Yes.

Q. And the use of the Z-test for market efficiency purposes was suggested more than a decade ago?

15:44:41 **A.** I think it was Fred Dunbar's work in Polymedica and then in the FDT article, which if I recall correctly, was published in 2004.

Q. Which would be more than a decade ago?

A. Yes, yes, correct. I was thinking out loud. The answer --

15:44:58

Q. Just checking my math.

A. Yes.

Q. All right. The Z-test tests a difference in incidence rates?

15:45:05 **A.** It's a test of two proportions. I don't know what you

mean by "incidence rates" in the --

Q. It tested two proportions. The Fisher exact test is a test of two proportions as well, correct?

A. It could be used as a test of two proportions. The classic circumstance of Fisher exact test is if you have a 2x2 table, like if you asked whether Republicans are more likely to be pro life in their political leaning or not, you have males, females, Democrats, Republicans. Fisher exact test is designed to deal with those situations.

Q. The Fisher exact test can be used to test different proportions, correct?

A. Yes.

Q. And is there a -- there's no size requirement for the Fisher exact test, is there?

A. Well, obviously there is some, because if you don't have enough observations in some of the cells, then you can't apply the Fisher exact test.

Q. But in this case, there's no sample size problem with Professor Feinstein's use of the Fisher exact test?

A. No, there is. Professor Feinstein's use of the Fisher exact test is a backstop to an insurmountable sample size problem in the Z-test. Just because Fisher exact test doesn't have a sample size requirement, it does not lead to a conclusion that Dr. Feinstein's application of Fisher exact test has no sample size problem.

Q. The Fisher exact test results were valid based on the sample size that he used?

A. Again, I'm trying to give you short answers. But I can't agree those results are valid. They are wrong in a variety of different ways.

Q. In terms of sample size, everything else put aside, just in terms of sample size, his results are valid?

A. You can apply Fisher exact test when called for with a sample size of nine.

Q. Let's switch topics and talk about whether the market was inefficient.

You've not given an opinion that the market in which Freddie Mac common stock traded during the class period was inefficient, have you?

A. Well, actually, I think, what I said in my report is Dr. Feinstein and previously Dr. Hallman did not adequately prove that the market was efficient, and if their evidence can lead to any conclusion, it's that it was not. I think I do say that.

Q. In other reports you've given, you've affirmatively testified that your analysis showed the market was inefficient, have you not?

A. In some other reports, yes.

Q. And you did not do so in this report, did you?

A. Well, again, that's not technically quite correct,

because the court heard evidence that in a related case, in Southern District of New York, Kreysar case, in connection with that case, I did conduct put-call parity test that did show evidence of market inefficiency during this class period.

15:48:45

Q. Let me stop you there, because first of all, that case isn't this case.

But you did a put-call parity test in the Kreysar case. You also have done tests such as put-call parity, serial correlation or Y filters tests in other cases when you've been acting as an expert for the defense, correct?

15:48:57

A. Sometimes.
Q. Yes.
A. When asked to, yes.
Q. Yes. Such as the AIG case?

15:49:06

A. Yes, correct.
Q. And in the AIG case, you ran those tests and determined that the market was not weak form efficient, and, therefore, opined that the market was not semi-strong form efficient, correct?

15:49:25

A. In part, yes.
Q. Okay.
A. Which is the record of this case, too, by the way.
Q. But in this case, you didn't run put-call parity, serial correlation or Y filters tests, did you?

15:49:31

A. I didn't repeat my analysis in the Kreysar case for purposes of writing a report here, yes.

Q. You didn't even present it in your report here, did you?

15:49:43 **A.** But you guys questioned me on it, your expert questioned me on it --

Q. Excuse me. Answer my question, Doctor.

You didn't present to this court in your report as a basis for your opinion any put-call parity test you ran in any other case?

15:49:55

A. In that narrow sense, yes.

Q. Well, I don't think it's narrow, but we'll agree to disagree.

A. Okay. Fair enough.

15:50:04 **Q.** Let me switch topics and talk about price impact.

You've given an opinion that there was a lack of price impact, even assuming market efficiency and assuming the truth of the allegations in the third amended complaint, there was a lack of price impact in this case?

15:50:39 **A.** Correct.

Q. And in part, your analysis of price impact was in response to Professor Feinstein on that issue, you indicated?

A. No, that's not quite correct. I give analysis,

15:50:56 affirmative analysis laying out my analysis and my reasons

as to why economic evidence does not support a finding of price impact.

MR. MARKOVITS: Slide 34, please, Kevin.

BY MR. MARKOVITS:

15:51:16 **Q.** Going back to your deposition. We were talking about price impact. Do you remember me asking you the question: "But you'd agree that there may be nonpublic information that would affect your price impact analysis following discovery and you're open to looking at that?"

15:51:35 Answer: "I'm always open to looking at all relevant evidence. My analysis here was, in part at least, responsive to Dr. Feinstein. And I didn't see him point to any evidence, other than the large price drop on that day, which was right there in the Complaint, and just repeating 15:51:50 Plaintiffs say so, that it was a revelation of alleged fraud."

Did I read that correctly?

A. Yes, I did say "in part," and you read that correctly.

Q. Your view is that Dr. Feinstein didn't point to any 15:52:08 evidence of price impact?

A. Well, that's not the only view on price impact I expressed in my report, that's, in part, my view.

Q. And you understand, though, it's not the burden on Dr. Feinstein or OPERS, the plaintiff, to prove price 15:52:25 impact, it's the burden on the defense to prove a lack of

price impact?

MR. FRANK: Objection, it calls for legal conclusion.

THE COURT: It does. I'll sustain that objection. Next question.

BY MR. MARKOVITS:

Q. You understood the burden you faced was to show a lack of price impact?

A. I was told by counsel to examine economic evidence and to render an opinion as to whether economic evidence showed any price impact, and I found none.

Q. And you're not giving an opinion on the truth or falsity of plaintiff's allegations of fraud, correct?

A. No, I'm not.

Q. And you'd agree that there was a roughly 29 percent stock decline on November 20th, 2007, which comfortably met the requirements for statistical significance?

A. Yes.

Q. You're not giving an opinion that the misrepresentations and omissions alleged had no price impact on November 20th, 2007?

A. So if you don't want me to explain, I'll simply answer your question as yes and no, even though I think a yes or no answer may not do justice to the analysis that I did and the opinions that I reached. But it's your call. If you want

just yes or no answer, just ask the question.

Q. Let's start with a yes or no answer.

A. Okay. So please ask the question.

Q. You're not giving an opinion that the misrepresentations and omissions alleged had no price impact on November 20th, 2007?

A. Actually, I think the answer would be yes. Those misstatement and omissions alleged in the complaint did not have any price impact on November 20th, 2007.

MR. MARKOVITS: Kevin, could you put up slide 37?

BY MR. MARKOVITS:

Q. Looking at slide 37, Doctor, which is, again, your deposition, page 92, beginning at line 23, "Question: Is it your opinion that the misrepresentations and omissions alleged have no price impact on November 20th, 2007?"

"Answer: No." And then you go on with an explanation.

Do you see that?

A. Yes, and that explanation is the key. What it says is, "My opinion is that when we look at the company's announcement on November 20th, we consider the contemporaneous market evidence on how that announcement was perceived by the market, the price decline on that date does not line up with Plaintiff's allegations regarding alleged disclosure defects based on the analysis of public information that I described." Which included, by the way,

15:55:57 no price impact of misstatements.

So the fact is, a price is impacted, as I understand it as an economist, when there is information and that leads to a price change. That's my working definition of "price impact."

15:56:16 If you say none of the alleged 23 misrepresentations are associated with significant stock price changes, because it was all price maintenance theory, fair enough, you can argue that, and then you say bad news was announced on November 20th, when that bad news had no revelation that can be tied to the fraud that you allege in 23 misstatements, how on earth can logically you say that the fraud impacted the price? Market didn't learn anything about anything having to do with the fraud on that day.

15:56:40 **Q.** Let's explore that a little bit logically. There was a huge loss on November 20th, correct?

A. Yes.

Q. Catastrophic, I believe you called it earlier?

A. Yes.

15:56:49 **Q.** And it resulted in a statistically significant price decline?

A. Yes.

Q. The plaintiffs have alleged that that loss came from undisclosed credit risk. Is that your understanding?

15:57:04 **A.** Yes.

Q. Without the benefit of all the discovery in the case, how can you prove that that loss didn't come from the undisclosed credit risk?

A. I can. Because subsequent to my deposition --

15:57:24 **Q.** Did you say you can or you can't?

A. I can. Yes, I can.

Q. Okay.

A. So all these statements, all the analyst reports I reviewed from November 20th to November 27th, all the mix of public information I looked at, Your Honor, and all the information cited in Professor Feinstein's rebuttal report that came subsequently, shows that the reason for that $2 billion loss was that Freddie Mac held securities in its portfolio which for GAAP valuation purposes were being valued based on marks that they got from the market.

And given the market illiquidity, because liquidity seized, the marks on those securities went down, which led to a large GAAP loss, which analysts at the time realized doesn't represent any credit loss. And Freddie Mac said in its press release, in its earnings call, radio analysts concurred in their commentary that this was a GAAP loss.

Freddie Mac's only exposure to subprime or high-risk loans came through triple-A rated securities in its portfolio --

Q. Doctor?

A. -- which it had already disclosed.

Q. Doctor, is the answer to my question yes, you can, is what you're saying?

A. Yes.

15:59:03 **Q.** Okay.

THE COURT: He can and he has.

(Laughter.)

THE COURT: You won't ask him to do that again.

MR. MARKOVITS: I didn't ask him to do it this time, Your Honor, but I got an earful.

15:59:10

BY MR. MARKOVITS:

Q. Let me try to clarify because I hear an explanation now that I've never heard before and that's contrary to what's in your deposition. So let's explore what you've said previously.

A. The only thing I would say, it's not contrary to my deposition.

Q. Let's explore --

A. Okay.

15:59:27 **Q.** -- what you said previously.

A. Go ahead.

Q. You're not giving an opinion that Freddie Mac accurately reported its exposure to credit risk for nontraditional mortgages, are you?

15:59:35 **A.** I'm saying there is absolutely no indication that they

did --
Q. You're not giving -- answer my question yes or no. You are not giving an opinion that Freddie Mac accurately reported its exposure to credit risk from nontraditional mortgages, are you?
A. As of that time, yes.
MR. MARKOVITS: Slide 38, please.
BY MR. MARKOVITS:
Q. Again, from your deposition, "Question: No. I'm sorry. That's not my question. I'll get there eventually. But a basic foundational question here, I just want to understand, you're not giving an opinion, one way or another, that Freddie Mac accurately reported its exposure to credit risk from nontraditional mortgages?"
"Answer: No, I am not offering an opinion one way or another."
Did I read that correctly?
A. You did. I'm not an accountant. I'm not offering an opinion --
Q. That's my only question, was did I read that correctly? Yes?
A. Yes, you did.
Q. All right. And you're not opining that no part of the losses and write-downs that were announced on November 20th, 2007, resulted from undisclosed credit risk from exposure to

nontraditional loans, are you?
A. Well, given the way that question is worded, the only answer to that question that you can logically give is no.
Q. All right. You can't answer questions about what were the components of the roughly $2 billion loss that was announced on November 20th, 2007?
A. I didn't look at their accounting, so I cannot, from that perspective. But I can look at what they announced --
Q. The answer is no --
A. Okay.
Q. -- correct? You can't answer questions -- the answer is yes, you cannot answer questions about what the components of that $2 billion loss were, correct?
A. Yes.
Q. You don't know to what extent Freddie Mac adhered to its underwriting guidelines during the class period?
A. Yes.
Q. The answer is you don't know, correct?
A. I don't know. I'm not an expert on underwriting guidelines.
Q. And so you can't conclude that no part of the 29 percent stock decline on November 20th, 2007 was due to Freddie Mac's failure to adhere to its underwriting guidelines, can you?
A. Series of questions that I have to answer the way I

have to, because I didn't do the work as an expert accountant or an expert underwriter, lead to an answer to that question which misleadingly connects the dots that you're apparently trying to connect. That's not --

16:02:17 **Q.** I just want an answer to my question, Professor.

A. Okay.

Q. You can't conclude -- Doctor, I apologize.

You can't conclude that no part of the 29 percent stock decline on November 20th, 2007, was due to Freddie Mac's

16:02:31 failure to adhere to its underwriting guidelines?

A. No, I can't. I haven't looked at those issues.

Q. And, Doctor, you've been subject, in other cases, of motions to exclude your testimony?

A. Yes.

16:02:44 **Q.** And in two of those cases, part or all of your testimony was excluded by the court?

A. Correct.

MR. MARKOVITS: I have nothing further, Your Honor. I will pass the witness.

16:02:57 THE COURT: Well, Mr. Frank is out of time, but if you -- that begging you offered up, if you have ten minutes --

MR. FRANK: Should I begin begging now, Your Honor?

16:03:12 THE COURT: Would ten minutes be of assistance?

MR. FRANK: I think I can easily be done within ten minutes.

THE COURT: Then I'll allow it. And because it appears that Mr. Markovits was not -- he hadn't completely used his time, although you didn't --

MR. MARKOVITS: I will cede my time to Mr. Frank.

THE COURT: Thank you both.

MR. FRANK: Thank you, Mr. Markovits.

REDIRECT EXAMINATION OF MUKESH BAJAJ, Ph.D.

BY MR. FRANK:

Q. Good afternoon, Dr. Bajaj.

A. Good afternoon.

Q. You're almost there. I just have a few brief questions for you, Dr. Bajaj.

With respect to your testimony being excluded, was there a change in the law that resulted in the exclusion of your testimony?

A. You know, I really cannot even answer that question. These things happen. I didn't take that as reflection on my work. It was whatever court's interpretation on some issue. I don't want to sound defensive. It happened. I don't remember anything of any substance about it.

Q. You were asked some questions about the Z-test. And I'm just going to ask you some high-level questions about the Z-test that I think put those questions in perspective.

Is Dr. Feinstein's Z-test a reliable method to assess market efficiency?

A. No.

Q. Why not?

A. For all the reasons we explained: too small sample size, a test that is misspecified, looking at news dates and fraction of news dates does not logically tell you anything about market efficiency.

In any case, all the data selection errors, all the ex-post selection errors, and when you even correct for the structural break and remove the last date, the Z-test is not even statistically significant.

So on its own terms, it's not reliable. It's not a scientifically valid method for a purpose like this.

Q. Well, Dr. Bajaj, let's put aside for a moment your criticisms of Dr. Feinstein's application of the FDT Z-test to this case, and let's just talk about the FDT Z-test generally.

A. Okay.

Q. Is an FDT Z-test a reliable method for testing market efficiency?

A. No. It has nothing to do with market efficiency.

Q. Why is that?

A. Because it compares fraction of news dates that are associated with statistically significant reaction relative

to non-news dates.

So as we looked at that example of ten news dates, five reacting, there's no logical connection between what proportion and market efficiency you need to focus on material news dates. Leave that aside.

Let's say you do a Z-test using properly selected material news dates. There was no look-ahead bias, nothing.

The hypothesis that is being told to this court to accept is if the market reacts to material news, correcting one of the flaws, large enough a proportion of times that it's statistically more than 5 percent, that would be the non-news date. That is an efficient market.

Now, think about what that means in this context. Plaintiffs have alleged 23 disclosure defects. Let's take the market reaction to be on 50 percent of the dates. Does that mean the court is to assume 50 percent of the time the market reacts to news? Which 50 percent?

There is no logical connection between the very premise of the test and what that test is being used for, namely, a presumption that all material disclosure defects throughout the class period distorted the stock price.

Q. Dr. Bajaj, is the Z-test a method generally accepted by economists for assessing market efficiency?

A. No.

Q. Has it been subjected to peer review and publication?

A. No.

Q. Is there a known rate of error for a Z-test's use in assessing market efficiency?

A. No.

16:07:31 **Q.** Is the Z-test a method that has been tested by economists to assess market efficiency?

A. No.

Q. Now, you were talking earlier about how Dr. Feinstein applied the Z-test in this case. In your opinion, did

16:07:48 Dr. Feinstein reliably apply the Z-test to the facts of this case?

A. No.

Q. Why not?

A. Because of all the errors I think I pointed to, ten

16:07:58 methodological errors in my report. We covered a few of those. Not recognizing the February 27th structural break date. Not having enough sample size. Using the last day of the class period, even when FDT's authors explicitly proscribe that. Using other disclosure-related dates. Not

16:08:24 applying continuity correction. Using a pooled variance to test to proportions.

All of the errors discussed in my report and today are in one direction. They overstate the significance of the Z-test. Some just lead to a biased conclusion, and some,

16:08:48 individually or collectively, are outcome determinative.

It's a mess, and I don't mean that derogatorily.

Q. Dr. Bajaj, you were asked some questions about your report in the Allergan matter.

Do you recall that?

A. Yes.

Q. You were asked questions about having run an event study on three dates in a case where there was a 39 trading day class period, correct?

A. Yes.

Q. Were those the only dates that you -- sorry about that.

Were those the only tests you ran in that case?

A. No. Actually --

Q. What other tests did you run in that case?

A. I have language in that report saying that the number of material news dates you can test is necessarily limited by the short class period. And, therefore, I did put-call parity test for every second of every trading day for all of those 39 dates, resulting in tens of millions of observations.

And only after I had done all that work, notwithstanding the fact that I said Cammer factor 1 indicates market efficiency, Cammer factor 2 does, event study does, not until I had done all the work did I issue an opinion that Allergan stock traded in an efficient market over that class period.

Q. What does a put-call parity test test for?

A. So Nobel Prize winning economist Robert Merton showed that if the market is pricing securities correctly, then some combinations of put options and call options is equivalent to owning the underlying stock.

So one way economists test whether markets are functioning well or are prices dislocated is to compare the price of the stock relative to the combination of put-call -- puts and call options that is economically equivalent to owning the stock.

And if there is a violation of that put-call parity, then an arbitrageur could make profits exploiting that put-call parity.

So how often do these violations occur is a direct measure of how effectively arbitrageurs are keeping markets efficient and not dislocated. And this is a very powerful test that allows you to determine whether market is efficient or not.

And I thought in the Allergan case it was called for, given that I could only test a handful of event dates over the 39-day class period.

MR. FRANK: Your Honor, I'll pass the witness again. Thank you for your indulgence, and thank Mr. Markovits, too. Thank you.

THE COURT: You're certainly welcome.

MR. MARKOVITS: Your Honor, could I have just -- I would say one more question, maybe two?

THE COURT: You may, sir, you may.

MR. MARKOVITS: Thank you, Your Honor.

16:12:07 RECROSS-EXAMINATION OF MUKESH BAJAJ, Ph.D.

BY MR. MARKOVITS:

Q. Dr. Bajaj, you were talking about the put-call parity test.

Can you point to me any peer-reviewed article which

16:12:14 supports the use of the put-call parity test for determining market efficiency in securities cases?

A. I'm sorry, could you please repeat the question?

Q. Yes. Can you provide me with the name of any peer-reviewed article that supports the use of the put-call

16:12:28 parity test for proof of market efficiency in securities cases?

A. So I can point you to cases where the court considered, but there's no peer-reviewed article that says it's appropriate for using in securities cases.

16:12:46 **Q.** Right. So there's no peer-reviewed article supporting the put-call parity test that you did in Allergan?

A. No, that's not true. There are many peer-reviewed articles in economics and finance that say it is an appropriate test for testing market efficiency. Those

16:13:02 articles were not written for securities cases alone. As a

general proposition --

Q. Can you point me to any case where put-call parity has been acknowledged by a court as proof of market efficiency?

A. How about Polymedica?

Q. It was acknowledged as proof of market efficiency in Polymedica?

A. It was acknowledged as a valid test of market efficiency. Fred Dunbar testified in that case.

Q. The court will determine whether or not that's the case. Thank you.

A. Thank you.

THE COURT: Thank you both.

Mr. Frank, you're keeping your seat.

MR. FRANK: I'm all set, Your Honor. Thank you.

THE COURT: All right, then.

Thank you, Doctor. You're welcome to stay.

Counselors, do either one of you intend to re-call Dr. Bajaj?

MR. FRANK: No. I think that we have completed the evidentiary portion and after a brief break we're ready to move on to the four oral arguments.

THE COURT: Thank you.

Mr. Markovits, you're in agreement?

MR. MARKOVITS: Yes. Thank you.

THE COURT: Thank you. You're welcome to stay and

enjoy the remaining part of the proceedings. We will have a ten-minute recess and we'll return for oral argument on -- starting with the first motion to strike, and that's Dr. Feinstein's testimony, and proceed as the schedule shows.

THE WITNESS: Thank you, Your Honor, especially for your indulgence.

THE COURT: You're more than welcome. You both were wonderful. We're in recess.

(Recess at 4:14 p.m., and the proceedings resumed at 4:25 p.m.)

THE COURT: The schedule shows that oral argument on the motion to dismiss Dr. Feinstein will start with Freddie Mac arguing first, followed by plaintiffs.

MR. FRANK: Thank you, Your Honor.

THE COURT: Certainly. Sir, do you care to reserve any of your 15 minutes for rebuttal?

MR. FRANK: I will reserve as many minutes as I can, Your Honor. Do I need to indicate them in advance?

THE COURT: So what you don't use, you'd like to reserve, is that how you're doing it?

MR. FRANK: Yes, Your Honor.

THE COURT: All right, then.

MR. FRANK: Thank you.

Your Honor, Dr. Feinstein's testimony is exactly

why Daubert standards exist. He has literally made up tests and techniques in order to avoid results that disfavor his clients.

There are three prongs to the reliability standard under Daubert. Dr. Feinstein's opinions fail all three. His opinions aren't based on sufficient facts. They aren't based on reliable methods. And he didn't apply his methods reliably to the facts of this case.

First, Your Honor, a quick word about Cammer/Krogman. Dr. Feinstein did not merely base his opinions on the structural factors of Cammer/Krogman. He also based them on the empirical factor. And the reason he did that, you heard from Dr. Bajaj, which is that in the real world, economists just do empirical testing. They want to find out is the market actually efficient. They don't just use the structural tests that, you know, a district court identified years ago that is now broadly used by the courts. Economists dive in and they figure out is the market efficient or not. And that is why Dr. Feinstein offered opinions based on empirical testing in addition to the structural factors.

Now, as you know, he ran two empirical tests. Both of those are seriously flawed. If this were to ever go to a jury, the court shouldn't allow him to testify to a jury, as he picks made-for-litigation techniques and matches

different standards that aren't accepted by economists generally in order to get to the desire that his client -- to get to the result his client desires.

His first test is his single date event study. That's almost by definition not based on sufficient facts. There was a 330 trading day class period here. When economists -- when you examine other cases where economists try to assess market efficiency, you'll see that they pick many dates.

The Freddie Mac/Kreysar case, there were dozens of dates that were tested. And economists try to show that the market is efficient throughout the class period. After all, the point is that on the misrepresentation dates that are alleged, that the market needs to be efficient on those dates so that the supposed inflation that is caused by the alleged lie affects the stock price. That's why you need to test many dates and throughout the class period. Here, the only event study that was run was run on the very last date of the class period.

Now, in his report, if you read it, he ends up -- he writes that his event study proves market efficiency. But he has recanted that statement both at deposition and this court. He says, "No, you have to take it holistically. That alone doesn't prove market efficiency." Nor could it possibly. It just doesn't logically make sense.

THE COURT: You mean holistically with the Cammer and Krogman or Unger factors.

MR. FRANK: With everything he has done. In other words --

16:29:40 THE COURT: And the Z-test?

MR. FRANK: And the Z-test.

THE COURT: Okay.

MR. FRANK: Now, in other words, he concedes it's not enough. And not only is it not enough, logically, it

16:29:48 doesn't make sense that it would establish market efficiency.

And that's because the very definition of "inefficiency" is a market that doesn't consistently react to public information. And, in other words, a market that

16:30:07 only sometimes reacts to public information is not efficient.

So take our analogy that we discussed with Dr. Bajaj during his direct examination of the company that has only one factory. That company may trade in an

16:30:23 inefficient market that is generally not responding to material news.

But if it has a catastrophic event like its one factory burns to the ground, it may on that one day respond as everyone would expect, the price of that -- of a security

16:30:43 in that company would respond. That doesn't make it

efficient for the prior year or so. That doesn't tell us anything. Yes, it responded to a catastrophic event. The market may have been efficient on that single day.

The best that the plaintiffs can do is they cite an article that actually criticizes a couple of outlier cases that use too few dates. The article that they reference in their brief actually states, "A serious and, in fact, fatal problem with this approach," the approach of selecting a handful of dates, let alone one date, they were dealing with a handful of dates, "is that one would expect to see such results if stock price movements were completely random and had no average correlation with news events." We can't just look at one date, that's consistent with inefficiency.

Now, in Groupon, Dr. Feinstein tested two dates over a seven-week class period. And in that case, he testified that that was on the low side. This class period is 330 trading days, which is approximately 66 weeks. If two is on the low side for 7 weeks, one for 66 weeks, this isn't science, Your Honor.

We have cited to the court several cases that reject event studies based on just a few dates and OPERS does not distinguish those cases. These are the Bell, George and Kreysar cases that appear on pages 8 through 10 of our brief and page 4 of our reply.

Now, not only is it not based on sufficient facts, it's not a reliable technique, for all of the reasons I've just described.

Now, as the court is familiar, the Daubert case set forth a number of factors to consider to assess whether or not a technique or a method is reliable. And we walk through those in our brief, both with respect to the single date study and with respect to the Z-test.

So with respect to the single date study, it's not generally accepted by economists or peer reviewed. OPERS appears to concede that point. There are no standards of control or rates of errors. There are -- this single date study was prepared solely for litigation.

Now, don't be confused. It is, of course, true that every expert needs to apply methods to their litigation. But here there's something more problematic about this single date event study. And that is, when you just describe what happens here, anyone can see how it was a litigation-driven test.

A first expert, Dr. Hallman, tests six dates. He sees that two, according to him, are statistically significant. A second expert, Dr. Bajaj, criticizes it and says, "You were wrong. Only one was statistically significant." Plaintiffs move to substitute Dr. Hallman with Dr. Feinstein. And what does Dr. Feinstein decide to

do? He tests just the one date that the parties agree upon.

That is not good science. You're supposed to hypothesize and then see your results. You're not supposed to know your results in advance.

16:33:50 In addition, in a securities case, you're not supposed to take the last day of the class period, for the very reasons that the authors of the FDT article say in that article. Everyone knows that plaintiffs choose a class period in the vast majority of cases where the stock price 16:34:07 declines on the last day. And so when you choose the last day of the class period, you're skewing your results in favor of your client.

In sum, the single date event study, that's not a reliable technique. It's not a technique that's based on 16:34:24 sufficient facts. And it wasn't -- it was based really for the purposes of litigation here.

Now, the Z-test fares no better, Your Honor. It too is based on insufficient facts. We walked through one of the textbooks today with Dr. Feinstein demonstrating that 16:34:40 the Z-test violates sample size requirements.

Now, Dr. Feinstein, he doesn't dispute that it violates the sample size requirements. His response is, "I ran diagnostic tests." Well, we are not familiar with any literature in the field that says those diagnostic tests 16:34:59 cure the results of his invalid Z-test.

But even if that could be true, and we don't accept that it is, the problem with his diagnostic test is that when you correct those tests for a structural break in February, they have insignificant results, too. When you correct his Z-test for a structural break in February and you don't include the final date, that's a statistically insignificant result.

So his Z-test, when it's corrected for the structural break that Dr. Feinstein didn't recognize, it yields statistically insignificant results.

Now, I think it's worth talking for just a moment about what a structural break is. A structural break is when the market, the average volatility changes in a statistically significant way.

So, in other words, when we're trying to measure what size price change is unlikely to have occurred merely by chance, what size wave in the ocean wasn't just by chance, but it was actually so unusual that we take note of it, you need a different ruler. In the lake, you might need a one foot ruler, and in the ocean you need the three foot yardstick.

And that structural break was found by Dr. Bajaj. He didn't engage in any data snooping or data mining. Your Honor saw Dr. Bajaj today. He's a man of integrity. And he identified this problem. He tested it with a Chow test, and

the very Chow test that Dr. Feinstein's team had used to verify an earlier structural break, the one in August. And ultimately, that structural break, which does exist, renders these tests statistically insignificant.

16:36:56 Now, not only do we have the insufficient fact problem that isn't solved -- now, remember what's going on here. They tested nine dates. They need at least 30. They test nine dates. Only four are statistically significant according to them. One is at the end of the class period.

16:37:13 So that leaves three. So based on three supposedly statistically significant dates, they're saying this whole class period was efficient.

Not only do they -- I'm sorry?

THE COURT: In your papers, there was more said

16:37:26 than I've heard today about none of the four dates being within the first five months of the class period.

What would you like me to make of that?

MR. FRANK: That's true, Your Honor, and we have it on our last slide and I was going to argue more about it

16:37:43 later.

THE COURT: Then I'll wait for it.

MR. FRANK: Let me say this about that: I think that is directly relevant to the motion for class certification.

16:37:50 But what I want to really talk about now is what

is bad science. Like what Dr. Feinstein has done is bad science. It is true that it's not really a reliable application of his test to not include any of the dates in the early part of the class period, the first five months. That's not really reliable.

16:38:10

They criticize Dr. Bajaj for doing something similar. But in a 39-day class period, they say, "Oh, you only tested dates in April." And Dr. Bajaj's response to that is, "I looked for every material news date there was and I tested every one. It was only 39 trading days."

16:38:25

So I do think he could be criticized for that. But there's a lot of other criticisms in terms of the reliability of his application here.

But before turning to that -- oh, unless, I'm sorry, Your Honor, you wanted to follow up.

16:38:42

THE COURT: Well, maybe you'll get to this. One of the things that Dr. Bajaj said that I thought served to bolster Dr. Feinstein's use of a single event date was the period. You know, he described it as tumultuous. He described it as catastrophic. Well, the events that led up to the recession, and that the mortgage market was the center of the recession, and that the center of even that, as if, you know, the eye of the hurricane, was Freddie Mac.

16:39:05

So if there is ever an occasion -- I mean, at some point, while I understand Daubert requires that there be

16:39:25

sufficient data, reliable method and the reliable application of the method, did we have an occasion for the kind of science that Dr. Feinstein employed?

MR. FRANK: Well, I think that when you have market conditions like that, it sets the stage for market inefficiency. And if you use reliable tests and you applied them reliably to sufficient data, you could then determine, did we have an efficient matter -- an efficient market or an inefficient market given these unusual market conditions.

THE COURT: Uh-huh.

MR. FRANK: Now, it's a little difficult to discuss that here, because Dr. Feinstein didn't use a reliable method. He didn't apply it reliably. He instead used a method that is based on insufficient facts. He used a method that doesn't even test market efficiency, as Dr. Bajaj explained. And he played so many games with the method, Your Honor. We identified ten flaws in his approach. And then, during the cross-examination today, I identified several more.

The fact of the matter is that this method doesn't assess market efficiency. And even if it could, which it can't, the way Dr. Feinstein applied it here in this case is simply not reliable.

And for all of those reasons, we believe that Dr. Feinstein's -- his opinions shouldn't -- they should

never go to a jury. His report should be stricken. And he shouldn't be -- his testimony should be excluded.

And to the extent I have any time left, and I may not, I'll reserve that time.

16:41:15 THE COURT: Well, I'll ask you a question I think I know the answer to. Of course, as you indicated well before the matter of whether a jury hears this evidence, is the question to be answered about class certification. And I think it's also your ask that I not consider Dr. Feinstein's testimony for that determination.

16:41:30 MR. FRANK: That's right, Your Honor. As we'll argue at that stage, you'll see one of the reasons, the very first reason why class certification should be denied is that they rely solely on Dr. Feinstein. His opinion should be excluded. And once that happens, they have come forward with no evidence to support their market efficiency burden.

16:41:45 THE COURT: Thank you, Mr. Frank.

MR. FRANK: Thank you.

THE COURT: For plaintiff?

16:42:01 MR. MARKOVITS: Thank you, Your Honor.

THE COURT: Certainly.

MR. MARKOVITS: May I proceed?

THE COURT: Please do, yes.

MR. MARKOVITS: Freddie Mac doesn't dispute that Professor Feinstein is a highly qualified economist. They

16:42:11

don't dispute that he is qualified to give an opinion on market efficiency, something he's done more than 50 times without exclusion. They don't dispute that he applied economic expertise within the legal standards established by Cammer, Krogman and Halliburton II. And they don't dispute his methodology or his results with respect to Cammer 1 through 4, Krogman 1 through 3, or the fact that Freddie Mac common stock trades on a national exchange. They take issue solely with the analysis of Cammer 5.

16:42:58 Kevin, could you put up slide 47, please?

In the Carpenters case, there was a very, very analogous situation, where Dr. Finnerty gave an opinion and there was the battle of the experts, which always takes place on Cammer 5; but in that case, as here, the other Cammer/Krogman factors were met, and what the court said in that case I think applies here. It's certainly -- it's not binding, but I think it's persuasive authority, in terms of saying, "... defendants' attack on Dr. Finnerty's opinion focuses almost exclusively on the event studies he performed in connection with Cammer 5. This challenge is too narrow. It is widely accepted that analysis of the Cammer and Krogman factors is a reliable and accepted methodology for establishing market efficiency." And then it goes on.

And the same could be said in this case. This is a reliable method for establishing market efficiency.

Dr. Feinstein said that market efficiency was established without Cammer 5, that Cammer 5 was just icing on the cake.

And he specifically said that those factors, those structural factors, if you want to call them, would be sufficient here.

Freddie Mac, turning to Cammer 5, Freddie Mac doesn't disagree that an event study is an appropriate methodology to help assess Cammer factor 5. In fact, they say it's absolutely required. Freddie Mac's expert disagrees with how Professor Feinstein applied that methodology. That's not surprising. Again, in virtually every case, there is a disagreement with regard to event studies. It's a rare case where that doesn't apply.

Let's look at some of those attacks on the event study. The primary attack is that Professor Feinstein's event study must be rejected because it has only one event date. Dr. Bajaj asserts that this shows, at most, that the market was efficient only on that date.

If, in fact, Professor Feinstein was using the event study alone to show efficiency during the class period, that argument might have some traction, but he's not. He's using it in conjunction with the other Cammer and Krogman factors which are present throughout the class period. He is using it as a demonstration, as he said, of market efficiency, not proof of market efficiency throughout

the class period.

The attack by Dr. Bajaj is particularly interesting given his work as a plaintiff's expert in the Allergan case. Apparently, Professor Feinstein's use of two dates is totally unacceptable for an event study -- or one date is totally unacceptable, but two dates is acceptable in the Allergan case.

THE COURT: Well, I think emphasis was on the difference in the periods of time.

MR. MARKOVITS: But, Your Honor, and there's a logical flaw with that argument, which is what Dr. Bajaj said in deposition and agreed to here, was his position in prior cases is that a two date -- when it was Dr. Hallman, he said a two date event study, at most, proves that the market was efficient on those two dates, period. The same would apply to his Allergan, which came after his critique of Dr. Hallman.

THE COURT: Uh-huh.

MR. MARKOVITS: You can't extrapolate. And I didn't present it here, but we talked a little in his deposition about how many dates can you extrapolate. There's no peer-reviewed article that talks about that. There's no peer-reviewed article that talks about extrapolation.

What the event study does is simply demonstrates

market efficiency. That on a particularly material news day, strongly material news, the market reacted efficiently.

So, again, one day is totally unacceptable. Two days is acceptable. Use of the last day of the class period by Dr. Feinstein, totally unacceptable. But when Dr. Bajaj does it in the Allergan case, it's acceptable.

I know foolish consistency is the hobgoblin of little minds, but here, in the legal context, it would be nice to see.

They challenge his use of the one event date, but they don't propose any other dates that he should have looked at.

There's a halfhearted reference in one of their briefs that he should have looked at earnings dates. But as Dr. Feinstein said, Dr. Bajaj said, "Well, the earning dates have mixed news." Well, if they have mixed news, they're not appropriate to look at as events dates.

And, you know, they would just get into -- there's just an argument about that. So if there's mixed news, you can't use them as events dates. He used the only date that he felt was appropriate to use as a test to show market efficiency. It showed market efficiency. That supports all of the other factors, which by themselves, virtually any court that's considered it, there is no -- put it this way: There is no court where all these factors have been met that

have said the market's not efficient, none.

A Z-test. He did a Z-test, which is sometimes also called a collective test, it's a type of test. In the case law that we cited in our briefs it's sometimes called a news/non-news test. And it's showing that principle that came out in that brief of the financial economist and then in Halliburton II, which is the general proposition that news -- that stock prices tend to react to news.

That's what the news/non-news test does. That's why it's been accepted, particularly after Halliburton II. Dr. Feinstein said he's used it in three cases. In the Petrobras case, for Cammer 5, his event study was -- I'm sorry, his Z-test was accepted without any event study. No event study was done. The Z-test was proof of Cammer 5. What the court said in that case is the Z-test is a commonly accepted statistical test.

Now, they say, "Well, his selection criteria was bad." What I will say for the record, darned if you do, darned if you don't. If he had looked at the news days and tried to subjectively determine which were material in terms of a higher information flow, they would have done what they did with Dr. Hallman and said, "Wait, he didn't look at all the news, that wasn't really positive, it was negative," things like that.

And the problem he faced is there are 2,900 news

days during the class period. Every day there's something mentioned about Freddie Mac. So he developed an objective screen, supported by the economic literature, of articles that focused on Freddie Mac that were in both The Wall Street Journal and New York Times. Purely objective.

And that resulted in a certain number of dates that were then tested. And under the Z-test and under the other tests that were run, showed that there was a statistically significant difference in proportion between news days and non-news days.

You raised the question about, well, why weren't dates chosen from earlier in the time period? They weren't chosen one way or another by him, they were chosen by the screen. If there were dates earlier in the time period where both The New York Times and The Wall Street Journal had had a story about Freddie Mac, it would have been in the Z-test.

So he used an objective criteria. Now he's being criticized for using an objective criteria. I'm sure he would have been criticized for using a subjective criteria as well.

THE COURT: You heard what I'll describe as criticism of including New York Times in that screening. Wall Street Journal, a business journal, recognized worldwide, apparently.

What have you to say about including New York Times?

MR. MARKOVITS: New York Times also -- I believe in our briefs we set forth various literature which talks about using major newspapers. The New York Times certainly qualifies in that category. And I believe there's also cites to specific articles which suggest the use of The New York Times.

I understand the distinction between a business and a non-business newspaper, but The New York Times certainly covers business. It's not -- we're not talking about the --

THE COURT: You didn't choose USA Today.

MR. MARKOVITS: Yeah. Well, exactly. But if you're talking about, if there was material news about Freddie Mac that came out, highly material news, strongly material news, you would expect to find an article in both The Wall Street Journal and The New York Times.

And that's what you found on a limited number of occasions. You found both of them carried that highly material news. That's the basis, that's the objective screen, and that's the use of the Z-test.

The structural break, we show it on the slides. That was data mining. That was -- if you look at what Dr. Bajaj said in his first go-round with Dr. Hallman, he

said the control period was steady through August 8th, not in the two periods, but it was steady through August 8, 2007.

16:53:51 And then, when he had to find something to discredit or attempt to discredit Dr. Feinstein's Z-test and these other diagnostic tests, then all of a sudden we come up with this February structural break, and then it's on a chart which exaggerates the difference when it's not really much of a difference at all. And it's just an example, as Dr. Feinstein said, of data mining or data snooping. 16:54:13

There were a whole bunch of other critiques. And, again, it goes back to what I said in the opening statement. They throw a lot up against the wall, see what sticks. A lot of it doesn't matter. You know, as we showed on the diagnostic tests, you can't use the last day. All right, take the last day out. 16:54:39 The diagnostic tests still have a valid result, a strong result that shows higher proportion of news to the non-news days.

They have all these -- they're trying to make up -- with a lack of substance, they're trying to make up with quantity. 16:54:58 That's not an appropriate attack.

Again, they can bring these issues up at trial, but Professor Feinstein, or "Feinstein," can talk through -- and there's not going to be any dispute on how he reached his opinion, particularly on the undisputed Cammer/Krogman 16:55:22

factors and the fact that this trades on the New York Stock Exchange.

I'm not going to -- I don't have time to and I can't address all the other issues. Just let me end by saying that Professor Feinstein is a well-qualified economist. He's testified without exclusion over 50 times. Their motion is without merit and should be denied.

Thank you, Your Honor.

THE COURT: Thank you, Mr. Markovits.

Oral argument on the motion to exclude Dr. Bajaj. Mr. Frank, you reserved no time and you had none left.

MR. FRANK: I appreciate that, Your Honor. Thank you for reminding me.

THE COURT: All right. Certainly.

Mr. Markovits, that goes back to your team.

MR. MARKOVITS: That's me again, Your Honor.

THE COURT: It is. All right, then.

MR. MARKOVITS: And if I could just reserve the balance if I have any.

THE COURT: Certainly.

MR. MARKOVITS: May it please the court.

Defense expert, Dr. Bajaj, is a financial economist who has certain beliefs regarding market efficiency. To paraphrase some courts, the question isn't whether he's right or wrong as an economist in his belief,

the question is whether his beliefs are contrary to the legal standard. And there can be no dispute that they are.

The law is clear also that an expert cannot provide opinions that are contrary to the applicable legal standard. Under Daubert, such testimony is unreliable, it's not helpful to the trier of fact, and it only steers to confuse.

Dr. Bajaj's opinions are contrary to the legal standard in at least the following respects.

Slide 48, please.

First, Dr. Bajaj would require OPERS to prove that the market for Freddie Mac stock traded in a semi-strong form of efficient market.

The Supreme Court in Halliburton II held that no particular degree or type of efficient market must be shown, just that the market is generally efficient. And courts since Halliburton II have specifically said a semi-strong form of efficiency is not required.

THE COURT: Is it your position that the efficiency was weak?

MR. MARKOVITS: No, Your Honor. In fact, in this case, Dr. Feinstein concluded that the efficiency was, in fact, a semi-strong form of efficiency. But that's -- he didn't conclude that that was necessary. In fact, he said it wasn't necessary. And that's not necessary under the

Halliburton standard. The Halliburton standard talks about general efficiency, not weak efficiency.

THE COURT: Uh-huh.

MR. MARKOVITS: It talks about general efficiency, and it says, "No particular degree of efficiency." We're talking about the modest proposition that stocks -- that news about a company will tend to affect its stock prices.

THE COURT: So that Dr. Bajaj insists that semi-strong is required, and your expert has said that it exists, what's -- I mean, the first point, what do you want me to make of it?

MR. MARKOVITS: The import of that is, he's saying it exists, but also certainly any lesser included standard, such as general efficiency as set forth in Halliburton II, is met as well.

I don't want the situation where if at trial, Dr. Bajaj is telling the jury, "You have to prove market efficiency to the semi-strong level of efficiency." That's not the legal standard.

It would be like saying, "You've got to prove that we make our case beyond a reasonable doubt."

THE COURT: If that were your only disagreement, would you be moving to strike his testimony?

MR. MARKOVITS: Probably not, Your Honor.

THE COURT: Yeah.

MR. MARKOVITS: This, and I'll show how all his testimony that's contrary to the legal standard compounds.

I probably wouldn't particularly, because as you said, our expert has opined that the market is semi-strong efficient.

16:59:42

But then he also talks about Cammer factor 5 as being necessary. And, again, he's saying not only that this is an important factor, which some cases said, but it's necessary and dispositive.

16:59:57

And the trouble is that his opinion on that is contrary to cases around the country within the circuit that hold that Cammer 5 is not necessary or dispositive. It's just one of the factors --

THE COURT: You know, maybe I misunderstood your cross-examination of Dr. Bajaj on that point, because I thought you and he -- or you got him to agree that Cammer 5 was necessary, and he agreed. And the next point was, is an event study needed to prove Cammer 5, and he agreed with you there as well.

17:00:12

MR. MARKOVITS: Right.

17:00:31

THE COURT: Do you remember that?

MR. MARKOVITS: Yes, I do. And what I was doing there was establishing his view.

THE COURT: I see.

MR. MARKOVITS: Confirming his view.

17:00:38

THE COURT: It was more tongue-in-cheek then?

MR. MARKOVITS: Well, to some extent, Your Honor. What I was trying to do was establish his view, which he had already stated in deposition and I understood what his view is, which is that Cammer 5 is required, and you have to do an event study to prove it.

THE COURT: And where I thought you and he broke ranks was at the position of whether it's dispositive or not.

MR. MARKOVITS: No. We actually break ranks pretty strongly with it being necessary and can only be shown through an event study. Because as we pointed --

THE COURT: And that's sort of where I interrupted you during your opening. If you have all of these factors, but the challenge to the event study or the Z-test or the collective event study fails you, what moment is there if you would like me to believe that all of the courts that have found the Cammer factors, Krogman factors, national exchange to exist, why is it a problem for you then?

MR. MARKOVITS: It's a problem because he's testifying contrary to the legal standard. He's saying that Cammer factor 5 is necessary when it's not. He's saying an event study is required when it's not. That's contrary to the law of all the courts across the country.

THE COURT: Number two Daubert, right, at least?

MR. MARKOVITS: Yes. And it's not reliable, it's not helpful, it's confusing to the jury, or will be confusing to the jury, to say, "You've got to have Cammer factor 5." Our expert is saying, "No, you don't."

17:02:11 The jury shouldn't have to weigh between those two experts. Dr. Bajaj's testimony is contrary to the legal standard. It can't stand, if that's true, and the case law makes it clear that's true.

The next one -- and I'll show in a second how 17:02:24 these compound.

The next one is he has testified that material news is news that's expected to cause a statistically significant stock price reaction. And that's why in deposition I honed in on that, because I didn't understand, 17:02:42 how can you say, how is it possible to say when all the empirical research shows that on earnings dates or other material news dates, you have a relatively low percentage of statistically significant stock price movement, how can he say that you should be expected to have a stock price movement on material news dates?

The answer is he just defines material news -- he makes up a definition of material news that's supported nowhere in economics, nowhere in the case law. He says, "Material news is news that's expected to move a price in a 17:03:19 statistically significant manner." That's just made up out

of whole cloth. And if that's not bad enough, not only is it made up out of whole cloth, but it's contrary to the legal definition of material.

So you can't have him testifying to a jury, "This is what material news is," when the legal definition is, no, material news is just news that a reasonable investor would consider in pricing a stock.

And he says that market efficiency must be proven to a 95 percent confidence level. The legal standard, and it's got to be proven by a preponderance of the evidence.

And this is where all his testimony contrary to the legal standards compound.

Kevin, could you put up slide 49?

So when you put together Dr. Bajaj's opinion in his statements, 1 through 5, he's saying, okay, you've got to show that the market is semi-strong efficient. The only way you can show a semi-strong efficient market is to establish Cammer 5. The only way to establish Cammer 5 is an event study. To do an event study, you've got to show it to a 95 percent confidence level.

So look what he's done. He now makes the burden on the plaintiff to show market efficiency to a 95 percent confidence level instead of preponderance of the evidence. This gets back to, he's essentially saying to the jury they've got to prove it beyond a reasonable doubt, when the

legal standard is preponderance of the evidence.

Your Honor, defense economists are not immune to Daubert. And while it's not typical to have a Daubert motion against defense economists, in this case it's called for.

17:05:14

I know that typically what's happened, and you see it with, actually, there's a lot of reported opinions on Dr. Gompers and some on Dr. Bajaj as well, where a court will just disregard his opinion. In the Computer Science case, the court said about Dr. Bajaj, what he said defies common sense. Apparently there was no Daubert motion, he wasn't excluded.

17:05:28

But here, where he's giving point after point after point that's contrary to the applicable legal standard, that should not be able to stand. And for that reason, we ask that his testimony be stricken and excluded under Daubert.

17:05:45

THE COURT: Thank you, Mr. Markovits.

MR. MARKOVITS: Thank you.

THE COURT: Mr. Frank.

17:05:55

MR. FRANK: Thank you, Your Honor.

Your Honor, at bottom, plaintiff's motion to exclude the testimony of Dr. Bajaj was a tactical maneuver. It was a tactical maneuver to offset the fact that Dr. Feinstein's opinions are so riddled with errors,

17:06:19

inconsistencies and unscientific made solely as this litigation approaches, that he fails to establish the Daubert liability standard.

It was not until Freddie Mac notified OPERS that it intended to file a Daubert motion seeking to exclude the testimony of Dr. Feinstein that OPERS first indicated to Freddie Mac that it would also move to exclude Freddie Mac's expert.

These motions that are before you, the OPERS' motions and the Freddie Mac motion, they are apples and oranges. Under Daubert -- Daubert has essentially two prongs to it. It's got a relevance prong and a reliability prong. We have moved under the reliability prong, and we've explained that under reliability, the court takes into account three factors, and we walk through that, and Dr. Feinstein doesn't satisfy any of them.

They don't have those arguments with respect to Freddie Mac's experts. They can't argue that our experts aren't qualified. They can't argue that our experts' opinions aren't reliable in the field. They just don't walk through those reliability factors. They try to give a little lip service to it because they're trying to match our motion, but it's just not the case.

What you heard today and what you see in the brief is essentially an effort to argue the law. They're trying

to advance their class certification arguments.

Now, the fact of the matter is that Dr. Bajaj's testimony is relevant and helpful to the court. You heard him today. I hope you found him helpful and relevant. He isn't testifying to legal standards.

17:07:56

You'll notice a portion of our motion to exclude Dr. Feinstein focused on legal standards. And that was because Dr. Feinstein's opinions, particularly at his deposition --

17:08:13

THE COURT: You think if you take it down it will leave my mind?

MR. FRANK: I'm trying to see the clock, Your Honor, because I always fail to --

THE COURT: Then I applaud you.

17:08:22

MR. FRANK: Thank you, thank you.

(Laughter.)

THE COURT: I'll tell you at any time what time it is as well.

MR. FRANK: Thank you. I'll try to reserve -- I have no time to reserve on this one, actually.

17:08:28

(Laughter.)

MR. FRANK: You know, Your Honor, the fact of the matter is that Dr. Bajaj's opinions are directly relevant to the issues before the court. His testimony bears directly on a key element of plaintiff's case. His testimony is

17:08:42

relevant to both market efficiency and price impact.

Now, Halliburton II didn't change the law on market efficiency. They try to argue -- they try to extract this sentence to suggest that it's not semi-strong form market efficiency in the informational sense, it's just general efficiency.

But the point they miss is in the amici brief in which that was referenced and in the case -- the decision of the Supreme Court as well.

17:09:17 What the court is really talking about and what Dr. Bajaj was explaining earlier today is just that the court -- the courts don't require fundamental efficiency. They require markets to be generally efficient in the informational sense, not fundamentally efficient. In other words, the stock has to -- the stock price has to move consistently when there's material news, in the expected direction, but not in the precise amount.

That is what -- that is fundamental efficiency that Dr. Bajaj referred to I believe as a myth. It doesn't have to move in the precise amount. Markets don't have to be that good. But they do have to incorporate consistently available information.

Now, Halliburton II didn't change the law. If you'll look at the sentence they rely upon in Halliburton II, it's quoting Basic. So there's nothing

really new there.

What Halliburton II really does do is it creates the opportunity for defendants to come forward with price impact evidence. That's exactly what Dr. Bajaj has done.

Now, you know, in terms of semi-strong form efficiency, you ask Dr. -- I mean, you asked Mr. Markovits -- I'm not aware of any other degree other than his J.D. -- you asked him about what his own expert opines, and his own expert purports to use the same standard.

I asked him at deposition: "Now, when you say semi-strong form efficient in the informational efficiency sense, what do you mean?"

"That there's sufficient proof that the market reflects and reacts to public information about the company."

"Is that different from semi-strong form efficiency?"

"No."

"Is it your opinion that the market for Freddie Mac stock was semi-strong form efficient?"

"Yes."

That's Feinstein's deposition on page 575.

Now, Mr. Markovits also argues that Cammer factor 5 is necessary as an opinion of Dr. Bajaj's that's

problematic.

The fact of the matter is, Dr. Bajaj, again, he's not testifying about legal standards and he doesn't have to precisely match legal standards. He needs to offer opinions based on his experience as an economist, and hopefully those opinions are helpful to the court.

I think, the fact of the matter is that in Basic v. Levinson, the Supreme Court was convinced by the science of economics. It does find economists' testimony helpful. And as a result, economists like Dr. Bajaj have been testifying about principles of their field for decades.

Now, it's also a fact that there are numerous cases that we've cited to the court that hold that Cammer factor 5 is the essence of market efficiency, the most important factor, the sine qua non of market efficiency. So to the extent that Dr. Bajaj says it's necessary, he's actually on all fours with many courts.

Now, in addition, he says an event study is required. The cases also say, and Dr. Feinstein testifies that an event study is the preeminent test used by economists to assess market efficiency. Dr. Feinstein has said it in reports and cases acknowledge it as well.

With respect to the materiality of news, there are multiple definitions of materiality. There's actually several legal definitions, and Mr. Markovits only shared one

of them with the court.

But the fact of the matter is that the whole point of an event study is that economists test material news because they expect it to affect market prices. The whole point of testing news to see whether there are stock price reactions, that's Cammer factor 5. And it's not -- his understanding of materiality is consistent with his field, and Mr. Markovits doesn't argue otherwise.

The fact of the matter is, the real problem we have here today is Dr. Feinstein has deviated from good science. He's made so many arguments that aren't supported by good science. He applies tests that don't test what he's supposed to test. That is the Z-test. He applies the test in a self-serving way. He deviates from what the FDT -- there's only one article about this Z-test in market efficiency, FDT. They say don't test the last day. He tests the last day. They pool their standard errors. They unpool them. He pools them. All these little changes, they end up affecting the outcome in favor of his client.

With respect to market efficiency having to be proved at a 95 percent confidence level, I think that just misstates Dr. Bajaj's testimony. He's not changing the standard of law that this court has to apply. He's talking about statistical significance and what economists do in an event study, and what they do is when they test an event,

they need to determine that that event couldn't occur solely by chance. And what they do is they use a 95 percent statistical significance level.

And I'll tell you a secret, Your Honor, but we have to keep it in this room. Dr. Feinstein, he used a 95 percent statistical significance level in his event study and in his Z-test. It's one of the only things he did that does comply with good science.

So to criticize Dr. Bajaj as if he is somehow trying to mislead the court into applying a different standard, it's just not true.

Now, the fact of the matter is, the very definition of a semi-strong form efficient market is that the market is responding consistently to material news throughout the period. And Dr. Bajaj has actually given the plaintiffs a break.

Why do I say that? Because I actually -- when I deposed Dr. Feinstein, he admitted that for, quote -- this is page 97 of his deposition -- "for a market to be efficient, it needs to be rapidly incorporating available information all the time." All the time. 100 percent.

Dr. Bajaj gives the plaintiffs a break and he says, "Look, statistics recognizes that there's sometimes noisy results. And while I realize that the verbal -- that the language of the -- that the very theory is all the time,

I would say 80 to 90 percent of the time."

That's what he said in the Freddie Mac/Kreysar case. The court adopted his reasoning there. And that's not -- it's not contrary to any legal standard. The legal standard is that it should be doing it, responding to material news consistently.

So all told, Your Honor, Dr. Bajaj's opinions are not challenged as unreliable under the Daubert standards, they're challenged as not relevant. And I hope you found them relevant here today, and I hope you found them helpful, and we'll be arguing more about them at the class certification motion.

THE COURT: Is there anything more you'd like to say about the confusing aspect? Because there are so many -- well, there are some points of difference. As you point out, the 95 percent confidence level is not one of them. Except I think Mr. Markovits would say that Dr. Bajaj would say it must be that, and as it happened, Dr. Feinstein used it.

But just anything at all you care to say about whether or not your expert's opinion would be confusing to a jury because of the differences.

MR. FRANK: Your Honor, I guess what I would say is that this is an area that is complicated, and I believe that Dr. Bajaj's opinions are the opinions that are

17:18:10 17:18:29 17:18:42 17:18:53 17:19:00

generally shared by economists. And if he were to sit there and toss away the science of economics in order to conform everything he said to the law, I think that -- I think that's the type of testimony that gets excluded on Daubert grounds, because, frankly, it's not good science. He has to testify based on what the field of economics say, and he has, and it's helpful and relevant.

And I actually think he's good at explaining his concepts, you know, as complicated as they are. So I don't think it gets -- I don't think it should be excluded on confusing grounds either.

As I said, I think the real problem here is that Dr. Feinstein is just not engaged in good science and is deviating from accepted methods and is applying his methods in ways that aren't reliable.

THE COURT: Thank you, Mr. Frank.

MR. FRANK: Thank you, Your Honor.

THE COURT: Certainly.

Your proposed schedule calls for a break. Does anyone need a break?

MR. MARKOVITS: Your Honor, I believe I had a few minutes.

THE COURT: How many do you think you have?

MR. MARKOVITS: According -- five, and I will take less. I will take two.

THE COURT: I think that's at least one finger more than my math shows. But if you think you have five, I'll indulge you.

MR. MARKOVITS: I will go three or four.

17:19:12 THE COURT: All right.

MR. MARKOVITS: Your Honor, I just wanted to respond to that. I don't know how this became about Professor Feinstein. This is a motion to exclude Dr. Bajaj.

THE COURT: Well, you can't really keep them 17:19:29 separate, motion to exclude either expert, even from class certification motion. I think you've done well enough, but you understand how it came together.

MR. MARKOVITS: I understand, except here's the difference and the major difference: Professor Feinstein is 17:19:43 providing an economic opinion that's consistent with the legal standards. Dr. Bajaj is providing an economic opinion that's inconsistent with the legal standards.

Halliburton II did effect a change. We've briefed that at length. There is no case post-Halliburton II that 17:20:02 said you need to prove a semi-strong efficient market. There are cases that say you don't.

There is no case that held that Cammer 5 is necessary. There are cases that say it isn't.

There is no case that has held an event study is 17:20:16 necessary. There are many cases that say it's not.

There is no case that has held anywhere that material news means a statistically significant price movement.

And, yes, they both use the 95 percent confidence level. But, again, the only logical conclusions from Dr. Bajaj's testimony, which is all contrary to the legal standard, is that the plaintiff's burden of proof has risen to a 95 percent confidence level. That's different than using a 95 percent confidence level in one factor, the Cammer 5 factor, for an event study, because that's what economists do.

So, Mr. Frank says, "Well, these are -- the views of Dr. Bajaj are generally shared by other economists." I would ask Your Honor to look at the Groupon case, because I thought it had a very -- the analysis there was directly on point.

That involved Dr. Gompers, actually, who was espousing some of the same type of opinions as Dr. Bajaj in this case, and the court there said, "You know, it's not to say that he's wrong as an economist, he's just not testifying in conjunction with the legal standards."

And the case law is clear, and they haven't disputed it. An expert, including defense economists, don't get a pass. You can't, under Daubert, testify contrary to the legal standards. That's what Dr. Bajaj is doing here.

Thank you.

THE COURT: Thank you, sir.

Does anyone require a break?

MR. FRANK: Your Honor, a break would be greatly appreciated.

THE COURT: All right, then. We have a ten-minute recess and then we'll return. Do you really intend to argue the Dr. Gompers motion?

MR. FRANK: I encourage the plaintiff to withdraw the motion or to withdraw their desire to argue it.

THE COURT: Well, I'll give you until the end of your break to tell me how well that goes.

(Laughter.)

THE COURT: We're in recess for ten minutes.

(Recess at 5:22 p.m., and the proceedings resumed at 5:33 p.m.)

THE COURT: Thank you, everyone. You can retake your seats.

Our schedule now calls for oral argument on lead plaintiff's motion to exclude the expert testimony of Dr. Paul Gompers. Mr. Markovits?

MR. MARKOVITS: Your Honor, the parties have reached an agreement to submit that on the papers.

THE COURT: Thank you. I will accept it on the papers.

That means that we can now move to argument on motion for class certification. Mr. Markovits?

MR. MARKOVITS: Thank you, Your Honor.

THE COURT: And I remind you, 30 minutes are set aside for that, up to 10 minutes of which may be reserved, and we can follow the same schedule, what you don't use of that 30 minutes, you can use for rebuttal.

MR. MARKOVITS: Thank you, Your Honor.

THE COURT: Okay.

17:33:48 MR. MARKOVITS: May it please the court.

Going back to what I said in opening, defendants don't dispute any of the Rule 23 requirements except predominance. Under 23(a), they don't dispute numerosity, commonality, typicality, adequacy of representation. I'm happy to address any of those requirements if the court has any concern. If not, I'll move on.

THE COURT: Please do.

MR. MARKOVITS: Under 23(b), they don't dispute superiority. And the dispute on predominance boils down to the presumption of reliance, which is shown through proof of an efficient market.

Again, with seven of the eight Cammer/Krogman factors handily met, with the common stock trading on the New York Stock Exchange, with no proof by defendants of an inefficient market, the question isn't even close in this

case.

OPERS has shown that Freddie Mac stock operated in an efficient market during the class period.

Case law from around the country and within this circuit supports that conclusion. Any conclusion to the contrary would be a definite outlier.

Now, defendants' argument, again, for class certification goes something like this: That market efficiency must be shown to be semi-strong; that Cammer factor 5 is necessary to show that semi-strong; that an event study is necessary to show Cammer 5; that Professor Feinstein's event study should be rejected and, therefore, class certification should be denied.

Defendants are wrong on all counts. And let me explain why by synthesizing some of the briefing and testimony you've heard here today.

First, let me go back to the Basic presumption of reliance. In Basic, the Supreme Court created the fraud-on-the-market presumption, which allows a presumption of reliance that the plaintiff can show by a preponderance of the evidence that the stock traded in an efficient market.

But again, the Supreme Court in Basic did not clarify what was required for proof of market efficiency. And even Dr. Bajaj recognized that in the article he wrote.

So as the courts began to apply the Basic presumption, different standards evolved with courts requiring different levels of proof of an efficient market. Some required a high degree of efficiency, like the Polymedica case that's cited a lot by the defendants, some a lower degree like the DVI case. Courts since Halliburton have essentially rejected the Polymedica standard. It can't survive Halliburton II.

And in Halliburton II, Halliburton was asking the court to toss out the fraud-on-the-market presumption, arguing that basically the research since Basic in 1988 showed that the markets are not always highly efficient.

The amicus brief that we referred to by the financial economists is very instructive in this regard. Again, the economists who signed on included both Eugene Fama, who is known as the father of the efficient market hypothesis, and one of his harshest critics, Robert Shiller, both signed on.

And the brief says, in part, that economists disagree about whether markets perfectly process information, how quickly they do so, but they do not generally disagree about whether market prices respond to new material information. And the brief makes a very important point.

Slide 14, Kevin.

I want to emphasize this point again stemming from the brief. Because what it says is -- and it should come up shortly -- "The key point for present purposes is that while the proposition that market prices respond relatively promptly to material information about a stock is true if the SSEMH is true, it does not depend on the SSEMH being true."

Meaning you don't have to show that there's a semi-strong efficient market to show that market prices respond relatively promptly to material information about a stock.

The court in Halliburton II cited to this amicus brief and its opinion, and the court clarified the Basic presumption.

Slide 51, Kevin, please.

It said that "The presumption was based on 'the fairly modest premise' that 'market professionals generally consider most publicly announced material statements about companies, thereby affecting stock market prices.'"

It specifically says, 2404 is the reference, "A market need only be 'generally efficient.'"

And it went on to say, "debates about the precise degree to which stock prices accurately reflect public information are," thus, "largely beside the point."

Again, the court said a presumption is based on a

stock trading in a generally efficient market.

THE COURT: Do you remember the discussion you had with Dr. Bajaj about this part of the amicus brief, and his answers included that fundamental form may not be true, but informational may still be?

MR. MARKOVITS: Yes.

THE COURT: Do you recall that?

MR. MARKOVITS: I do recall that, and that you will find nowhere in the financial economist brief. It is clear what they were saying in the last slide was as interpreted by the Halliburton II, as interpreted by courts that have interpreted Halliburton II, that the fairly modest premise that material news affect stock prices can be shown outside of a semi-strong form of efficient market. That no particular level of market efficiency has to be proven.

And, again, courts subsequent to Halliburton II, Carpenters in particular, the Carpenters case, specifically did that analysis and said, "Defense, you're wrong. You don't have to show market efficiency at the semi-strong level. Halliburton II dealt with that."

So before -- after Basic, before Halliburton II, the courts had varying ideas of what degree was required. After Halliburton II, this idea that you need semi-strong efficiency, that you need Cammer 5, that you need an event study, those were all laid to rest. And the courts have

been consistent in saying that those notions, the notions espoused by Dr. Bajaj and the defendants, have been laid to rest.

Slide 52, Kevin, please.

17:41:10 Here's a couple of examples of recent cases. The one at the top, the Forsta case, said, "To require an event study 'would ignore the Supreme Court's recognition that debates about the precise degree to which stock prices accurately reflect public information' are 'largely beside the point.'"

17:41:29 In the Carpenters case, which also said semi-strong efficiency was not required, said, "In light of Halliburton II 'in the ordinary case of a high volume stock followed by a large number of analysts and traded on a national exchange, whether a plaintiff can satisfy Cammer 5 is not dispositive. Nor is an event study always necessary.'"

17:41:42 And then in the Strougo case, "In light of Halliburton II, 'requiring a plaintiff to submit proof of market reactions - and to do so with an event study - ignores Supreme Court precedent as well as practical considerations."

17:41:57 THE COURT: I appreciate that those are all recent, but none are binding on this court, are they?

17:42:10 MR. MARKOVITS: No, none are binding on this

court. And the Sixth Circuit hasn't specifically ruled on this, although courts within the Sixth Circuit have acknowledged the Cammer and Krogman factors as probative, something Dr. Bajaj does not, and acknowledged that the Cammer 5 is not dispositive, that was in the Plumbers and Pipefitters case, and have considered in Bovie, Burges, Plumbers, the Plumbers and Pipefitters case, a number of cases within the circuit have acknowledged generally that you look at all these factors, you apply them, Cammer 5 is not dispositive.

But you're correct, Your Honor, the Sixth Circuit has not specifically ruled on this point. Every circuit that has ruled on this point, every court that's ruled on this point post-Halliburton II has come to the same conclusion, though.

Which brings us back to the point that defendants' attack on Cammer 5, they, again, throw up dozens of attacks, just distract from the primary question, which is: Is the market efficient? And the answer there is clearly yes.

Halliburton II, as the defense has pointed out in their brief, also clarified that defendants can rebut the presumption of an efficient market at the class certification stage by showing a lack of price impact.

However, the burden of production and persuasion is squarely on defendants on this point.

Slide 53, please, Kevin.

In the Halliburton II, Justice Ginsburg says, "The court recognizes that it is incumbent upon the defendant to show the absence of price impact."

17:44:17 And Justice Thomas in dissent said, essentially, "In practice, the so-called 'rebuttal presumption' is largely irrebuttable." Well, why did he say it's largely irrebuttable? Well, this case provides a good example of why. Because to prove a lack of price impact in this case, 17:44:37 defendants would have to show either that there was no statistically significant price decrease on November 20th, 2007, or that no part of that statistically significant decrease was linked to OPERS' allegations.

Well, there's no dispute that there was a 17:45:00 statistically significant decrease. Professor Feinstein mentioned that there are a number of cases where in the last day of the class period, there's not necessarily a statistically significant decrease.

This one there is a very large statistically 17:45:10 significant decrease. The stock price dropped almost 30 percent. And it would take far, far less than that to have statistical significance.

So what defendants have to do is they have to prove that no part of that decrease was related to OPERS' 17:45:27 allegations; that is, assuming OPERS' allegations are true,

can defendants show that no part of the loss that resulted in the stock price drop was a result, for example, of exposure to credit risk from nontraditional loans, one of our allegations.

17:45:45 Can they show that no part of the loss that resulted in the stock price drop was as a result of the failure to follow their underwriting, resulting in a materialization of the risk that was caused by that failure?

The answer is no. And the fact is, they don't even try. Dr. Bajaj, as you saw in his testimony, his deposition testimony, said that, in part, he was responding to Professor Feinstein.

He states that he did no analysis, no analysis of what comprised the loss that was announced. He didn't even look at all the information that came out on November 20th, 2007, he reviewed some analyst reports, looked at the press release, and he was looking for what's called -- what he called a corrective disclosure. Finding no corrective disclosure, he concluded there was no price impact.

17:46:44 That's not close to meeting the legal burden. There can be price impact without a corrective disclosure or an acknowledged corrective disclosure. He has to show, again, that no price -- no part of that loss was caused by anything related to plaintiff's allegations. And, again, he has not even tried to do so.

The final argument that defendants use to try to derail class certification is the Comcast-related argument. And as we set out in our brief, courts differ in their treatment of Comcast. Some courts say it doesn't even apply in the securities context.

In the Sixth Circuit, there is Sixth Circuit law on this --

Kevin, can you pull up 54, please?

In the VHS case, the Sixth Circuit says, "Comcast applies where there are multiple theories of liability, those theories create separable effects, the combined effects can result in aggregated damages."

Here -- you can pull that off, Kevin.

MR. LEWIS: Pull what up?

MR. MARKOVITS: You can pull that off.

MR. LEWIS: Okay.

MR. MARKOVITS: Here there are no multiple theories of liability. The theory is a violation of 10b-5.

There are no multiple damages. The damages are the out-of-pocket loss.

All damages will be determined by the standard out-of-pocket measure described by Professor Feinstein.

Under Sixth Circuit law, Comcast is not even applicable.

I keep wanting to go with his brother's

pronunciation.

THE COURT: He's forgiving, I can see him.

(Laughter.)

MR. MARKOVITS: Yet it's typical in securities actions, and you're going to see this in virtually every expert opinion by the plaintiff expert on market efficiency, for the expert to just state, set out that the damages can be determined on a class-wide basis, here's the theory, here's how I determined the damages, and they're consistent and can be determined on a class-wide basis.

If you look back at Dr. Bajaj's report again in Allergan, he has two short paragraphs at the end of his report which supposedly, according to him, meet the Comcast requirement, and they're even in less detail than Professor Feinstein's.

Yet defendants tried out Dr. Gompers to argue that Comcast requires more, that it requires the level of detail that's typically found later in the case at the loss causation stage. And that reading of Comcast, as we set forth in our motion with regard to Dr. Gompers, has been rejected by every court where he's raised it.

He has raised it -- after Comcast, he's been hired by defense counsel in 11 cases to bring out that same theory. He has been shot down every single time. He's 0 for 11. Including cases in which the court has said,

"Dr. Gompers' approach here is contrary to the requirements of Comcast." It was rejected by those courts, that approach. It should be rejected here as well.

For all of those reasons, OPERS respectively requests that the court grant its motion for class certification.

THE COURT: Thank you, Mr. Markovits. The balance of your time is reserved.

MR. MARKOVITS: Thank you.

THE COURT: Mr. Frank?

MR. FRANK: Thank you, Your Honor.

Your Honor, first, let me begin by thanking you for providing us so much time today to address these matters. We take them seriously and we appreciate the court's time.

Your Honor, OPERS' motion for class certification should be denied for four reasons.

First, OPERS' motion rests solely on the opinion of Dr. Feinstein. And as we've argued, Dr. Feinstein's opinion should be excluded for the reasons we explained in support of our Daubert motion.

Second, even if the court were to allow Dr. Feinstein to testify as to his opinions, Dr. Feinstein fails to establish that Freddie Mac stock traded in an efficient market during the class period.

Third, Dr. Bajaj has established a lack of price impact. The alleged misrepresentations did not impact the price of the stock, and that rebuts any presumption of reliance.

17:51:38 And fourth and finally, Dr. Feinstein failed to demonstrate that he can calculate damages consistent with plaintiff's theory of liability as required by the Comcast Supreme Court decision.

Your Honor, I won't dwell on the Daubert point, 17:51:54 but suffice it to say that our Daubert motion, we believe, is dispositive of the OPERS' class certification motion. As you know, we believe that his opinions should be excluded under all three prongs of the standard. If Dr. Feinstein's testimony is excluded, of course, OPERS has nothing else to 17:52:13 support its motion.

Dr. Feinstein, however, even if he were allowed to testify, just because a court allows experts to testify doesn't mean it necessarily agrees with one expert or another, and we believe that Dr. Feinstein, even if his 17:52:29 testimony is not excluded, has failed to demonstrate market efficiency.

Dr. Feinstein's opinions, as you know, rest exclusively on his consideration of the so-called Cammer/Krogman factors. Contrary to what OPERS wants you to 17:52:45 believe, all Cammer/Krogman factors are not entitled to

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equal weight. Seven of those factors are common to virtually all large companies that trade on a national securities exchange.

While OPERS cites one case from Missouri which notes that there's a presumption that if you're on a large exchange, you trade in an efficient market, that is not the law of the land. It's not the law in this court.

We know from studies from economists that not all large companies that trade on national securities exchanges are trading in efficient markets. There are literally dozens of examples of companies on NASDAQ and the New York Stock Exchange that meet Cammer/Krogman factors that weren't trading in efficient markets as established by the economic literature.

As Dr. Bajaj testified, economists assessing market efficiency outside of the litigation context assess factor 5, empirical evidence of a cause and effect relationship between material information and stock prices.

Now, I know you heard arguments about statistical significance, and you asked me earlier about whether such a thing would confuse the jury. And, Your Honor, I commend to your attention the Federal Judicial Center's Reference Manual on Scientific Evidence.

The fact of the matter is that economists and other scientists testify all across the country all the time

on the basis of their fields, and in particular, uses a touchstone statistical significance at the 95 percent level. That's actually specifically noted at I believe page 269 of the Federal Judicial Center's Reference Manual.

17:54:26 It actually includes a footnote acknowledging that the Supreme Court has implicitly embraced this level as the accepted level of statistical significance.

Now, Your Honor, economists in the real world, I know we think our world is the real world, but outside of 17:54:46 litigation, they don't even consider the other Cammer and Krogman factors when assessing market efficiency.

That is why Dr. Feinstein testified in another case that the fifth factor is the essence of market efficiency. That is why the First Circuit in the Xcelera 17:55:03 case stated, "In the absence of such a cause and effect relationship, there is little assurance that information is being absorbed into the market and reflected in its price."

That is why the Fifth Circuit in the Unger case stated, "This causal connection goes to the heart of the 17:55:19 fraud-on-the-market theory."

That is why the Freddie Mac/Kreysar court referred to the fifth factor as the critical factor and to all the other factors as the less important factors.

Now, it's the fifth factor that matters, Your 17:55:36 Honor. The fifth factor that, even as Dr. Feinstein admits,

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is the essence of market efficiency.

Now, we don't have the time to discuss every single case that's in the briefs, of course. But I do want to share with Your Honor a few facts that justify the denial of the motion for class certification and that are distinguishing facts when contrasted with cases that are advanced by the plaintiffs.

First, Your Honor, in this case, there's a flawed event study. That matters to courts. It's one thing for a court to say, "I don't need to consider Cammer factor 5, I'm just considering these other factors," which you want to talk about outliers, those are outlier cases.

Most courts that discuss these factors understand and acknowledge that Cammer factor 5 is the most important factor, the essence, the sine qua non, all these phrases. Those are the outliers.

But in any event, when we see a flawed event study like this, courts care. Because you -- because inferences can be drawn from that. It begs the question: Why? Why is there a flawed event study? Why is this most important factor not being addressed? Why is it that an expert came into the courtroom with the purpose of establishing market efficiency and failed to do it? It is a troubling fact, courts noted, and it's a distinguishing fact in some of their relevant cases.

17:57:34 In addition, Your Honor, this case is unlike many of the cases in the briefs before you, because of the reason that the judge -- that you articulated earlier, and that Dr. Bajaj testified to. There was a financial crisis in this country. It began in the year arguably 2006, but certainly in early 2007.

17:57:51 In February of 2007, there was a structural break in this market. You can see it on the chart, the volatility changes. And on that day, the chairman of the Fed noted that the company was -- that the company -- that the country was headed for a recession. And the Dow dropped more than it had dropped in six years since 9/11.

17:58:14 That was only the beginning. In August, the crisis continued. And we see in the charts -- and I don't know if I have the charts here. But we see in the -- can we pull up the volatility chart from August?

You see in the volatility chart from August how very extreme the volatility was in this market.

17:58:35 17:58:57 Now, those are specific circumstances, Your Honor, that should cause the court to take more -- even more seriously than usual Cammer factor 5. Why? Because it is simply the case that you can look at a company and you can check some boxes: What is it? Is it traded on the New York Stock Exchange? What was its average volume during a period? I'm going to check some boxes.

But when you see irrational behavior in the markets, these are the conditions that give rise to market inefficiency.

And Dr. Bajaj was not surprised, and I'm not surprised, that two experts have filed four reports with this court, and they have utterly failed to establish market efficiency.

Now, before turning to Dr. Feinstein's analysis of the fifth factor, it's worth recounting a bit of history here. We've mentioned the Freddie Mac/Kreysar case in our briefing and we've mentioned it a few times today. And the court may wonder what the relationship of that case to this is.

That case was very similar to this case. That case also arose out of the subprime crisis. I misstated a fact earlier to the court. I had thought that there was an overlap with the class period. It came just after this class period.

THE COURT: I think you were corrected by the witness when you did that.

MR. FRANK: I may have been. I may have been. But I did not want to mislead.

And that case also arose out of the subprime crisis. That case was, again, some of the very same defendants whose counsel are here in this room, Mr. Syron,

Mr. Piszel and others. That case related to the preferred stock of Freddie Mac, and in that case, a purchaser of the preferred stock brought claims based on some of the same sorts of representations that are issued in this case.

18:00:33 In that case, the plaintiff's expert opined that the market was efficient. He testified that all of the lesser Cammer factors were satisfied. He tested 57 dates and found that 16 had statistically significant price reactions.

18:00:48 Dr. Bajaj testified at a Daubert hearing in that case, too, and there, just like here, he explained why those facts did not support a finding of market efficiency. And there, the court, Judge Cedarbaum in the Southern District of New York, credited Dr. Bajaj and denied class 18:01:04 certification.

That brings us to this case. Here, Dr. Feinstein was retained to replace OPERS' first market efficiency expert, Dr. Hallman. Dr. Hallman conducted event studies on six earnings dates.

18:01:19 Can I get Dr. Hallman's? Oh, it just got turned on. Okay. So this is the third-to-last slide, two back from there.

So Dr. Hallman tested six earnings dates, Your Honor. The green ones are the ones that were not found to 18:01:36 be statistically significant. And the H5 is August 30th,

and H6 is November 20th. So he found those two dates to be statistically significant.

18:01:53 And as you might expect, it was not too complicated for Dr. Bajaj to look at this chart, or at least these facts at the time, and say, "This is a gentleman who's identified only two dates that responded statistically significantly over the course of this entire class period. Two out of six isn't always responding. It's not most of the time."

18:02:12 And the interesting thing here, Your Honor, is that if you look at H5, H5 didn't take into account the August structural break. It was using the wrong yardstick to measure what is an extreme price movement. And when Dr. Bajaj fixed that, H5 wasn't statistically significant

18:02:32 anymore, leaving only H6. Okay.

Now, Dr. Feinstein entered the case at that point, where an expert had essentially established that only one out of six dates was statistically significant. They replaced Dr. Hallman with Dr. Feinstein. And Dr. Feinstein

18:02:56 essentially agrees that there's a structural break there. He agrees with the analysis that rendered that date statistically insignificant.

Now, we'll get back to August 30th. It has an interesting story in this case.

18:03:12 Now, claiming -- in support of the motion to

substitute, Dr. Feinstein submitted a declaration. His sworn statement in that declaration was that, quote, "If permitted by the court to provide a report and opinion on market efficiency, I would prefer to conduct my own event study so that I may apply the methodology in the manner I usually do."

18:03:29

In fact, Dr. Feinstein deviated from accepted methods and his own usual methods. For example, the Z-test. In the Z-test in the past, he had based them on earnings dates. In this case, for the first time, I believe ever, for Dr. Feinstein, he didn't use all of the earnings dates available.

18:03:48

Now, as we've discussed, Dr. Feinstein conducted two studies. His single date event study doesn't establish market efficiency. We've already -- I've talked about that at length on his Daubert motion, and I won't bore the court by repeating those arguments.

18:04:05

Suffice it to say that simply testing a single date doesn't establish market efficiency. It's not excused by the fact that there's more volatility. It's not excused by the fact that this market was tumultuous. If anything, given the extreme volatility over the course of this class period, it was incumbent upon Dr. Feinstein to test more dates, not fewer dates.

18:04:24

18:04:48

Now, Dr. Feinstein's test, if it suggests

anything, it only suggests that we should be weary of his methods. He chose a date where he already knew the result. He chose a date where he already knew that our retained expert hadn't challenged that one date in terms of statistical significance. He chose a date when he already knew that date was chosen by the plaintiff as the last day of the class period. He chose a date when he already knew that that date had a 29 percent stock price decline. And then he claimed that there was not a single other date during the class period that was appropriate for testing.

Now, Dr. Feinstein's Z-test also fails to establish market efficiency. It doesn't even test market efficiency, as I explained earlier. In fact, it doesn't even test whether a market is sometimes efficient, because it takes -- it doesn't take account of the direction of stock price movements.

You may recall that Dr. Bajaj was testifying earlier today that if you test -- if you want to test the efficacy of a drug and you just test whether it causes a change, and one of those changes is that a person dies upon taking the drug, you can't then determine that that drug is effective, you have to take into account directionality. It's not merely whether something causes a change.

And let me give you an example of it that's in the realm of market efficiency and not pharmacology. If you,

for example, are testing unexpected good news, that is, a company, the Wall Street expected its revenue to be announced at $500 million and it has an upside surprise, it comes out the day that it's due to announce its earnings and it says, "We didn't earn 500 million as expected, we are reporting 700 million," you expect that stock price to be impacted because that's material news, and it to move in the expected direction. If it doesn't move, that's not evidence of efficiency. If it moves down, that's certainly not evidence of efficiency, that's evidence of inefficiency.

The Z-test doesn't take into account that directionality.

Now, amici briefs are not the law of the land. But if you look at what Professor Fama has submitted, Professor Fama's view of semi-strong form efficient markets is that markets moved promptly and consistently in the expected direction.

Now, Dr. Feinstein's test, so it doesn't test market efficiency. But even if it did, Your Honor, as we've explained in our briefing and as Dr. Bajaj walked through today, and as we explored on cross-examination, it's riddled with numerous flaws. We've walked through that it has an insufficient sample size. I won't walk through those dates again. It just violates those conditions.

Even if it didn't, it tests too few dates. One of

the things he's done is that he could have done traditional event testing and we could have been here where he tests nine dates and says four of them are statistically significant, and you could be comparing these cases to cases like Freddie Mac/Kreysar, Strougo, which they referenced where 5 of 15 were found to be statistically significant and we could be arguing about traditional tests.

But because four of nine, but really three of eight because he should drop off the last one, because those numbers, they're just not good enough to show consistent price reaction, he uses his collective test. Yeah, in every case where he applies it, his results are going to look better than in the traditional event study testing.

Now, in addition to testing too few dates, his date selection process is just unprecedented. That is not an accepted way of selecting dates. And you can see -- you don't have to be an economist to start to see the flaws in it.

So he uses The Wall Street Journal and The New York Times, but the article has to be about them, it can't just be published. He's looking -- he claims there were no other material news date to test, but now he's testing dates that supposedly have higher information flow. But they don't really have higher information flow, because he's using dates that aren't actually on the same date that the

article comes out.

The whole thing makes no sense. I think Dr. Bajaj fairly described this entire situation as kindly as he could, as a mess. It's just a mess, Your Honor.

18:09:57 And this is just -- that's just his date selection process, for which there is no acceptance in the scientific community.

He includes the corrective disclosure date in his Z-test. His Z-test is based on the FDT article. The FDT, 18:10:12 the authors of that article, said, "Don't include a corrective disclosure date." He does that. That skews his result in favor of his client.

In addition, Your Honor, he improperly pools standard deviation estimates. That sounds really 18:10:28 complicated, but in the end, in the end, all it's about is the ruler and the yardstick we were talking about before.

When you have two different populations and one you need to be measuring it with a ruler and the other you need to be measuring it with a yardstick, you can't pool 18:10:47 them together and use the average of those two to measure what -- to measure the phenomenon you're testing. It is scientifically improper. FDT, they use the unpooled approach. He used the pooled approach.

He didn't employ a continuity correction. At 18:11:08 deposition he was honest with me, Your Honor. We had a

lengthy colloquy, which ended with the sentence that I confronted him with today. I said to him: Isn't it fair to say that that was an immaterial error?

And you know what he did? He told me the truth; from his perspective, that was an error. And it was immaterial, because when it's taken alone, it doesn't render his results statistically insignificant.

But when you just combine it with a couple of other things, it does. You only have to do three things to render -- there's a couple -- there's two ways to make his test statistically insignificant. Here they are:

One, you knock off the last day like you're supposed to under FDT.

Two, you employ a continuity correction like you're supposed to when he admitted to me it was an error and as Dr. Bajaj testified you should employ a continuity correction.

Three, you use unpooled estimates like FDT does in their article and as they indicate you ought to in a footnote. Granted, a complicated economic footnote, but a footnote.

And if you do those three things, his results are statistically insignificant.

But there's another way that ends this whole discussion. His results are also statistically

insignificant when you take into account a structural break in February. He doesn't dispute the arithmetic. There was a structural break in February. No one disputes what really happened. The Dow dropped more than it had in six years. The chairman of the Feds said, "We're about to enter a recession." We actually did enter a recession.

When you take that into account, it has two impacts I want to share with you. First, if you take that into account and drop off the -- I'm going to call it F9, can you go to the next slide, please, actually the last slide? When you take that into account and you drop off F9, his Z-test is statistically insignificant.

Now, remember, his Z-test, the only way he justifies it because the sample size is too small, is he says, "Well, trust my Z-test. My diagnostic tests show that my test is robust."

Well, guess what, all you have to do is acknowledge that there's this structural break. None of his diagnostic tests work. He only gets where he gets by playing a lot of games with the science, Your Honor. It's not good science. And it certainly doesn't support their motion for market efficiency.

Unfortunately for everyone, Your Honor, I'm not done. There are more errors in his approach. He also chose to combine estimation periods resulting from the structural

break. So remember, when you have a structural break, you've got a different yardstick. Now, when you have two structural breaks, you have three different yardsticks. In one of his other cases, the Electrobras case, he treated them separately. Here he didn't do that. He picks and chooses. It didn't work for him in this case.

18:14:21

Now, he -- in addition, Your Honor, he does not account for the statistical error inherent in his market model when calculating his Z statistic.

18:14:56

The problem here, Your Honor, is he has a test upon a test. And his test has a potential error. And then his test upon his test has a potential error. And that's a problem for scientists. That's a problem for economists. He doesn't account for the statistical error inherent in such an approach.

18:15:14

For all of those reasons, he has failed to establish market efficiency.

Now, Your Honor, I want to talk to you for a moment about these dates, because he says that four of the nine dates were statistically significant. And when you actually focus on the dates, it's interesting to see what happens.

18:15:30

Okay. Well, we've explained before, on this slide, let me make clear what the four dates are that I'm talking about.

18:15:43

18:15:57

Okay. F1 and F2, do you see how they're in red?

Actually, can we go back a slide? It will make it easier. Okay.

F1 and F2, Dr. Feinstein says those are statistically significant. Okay?

F6 he says is statistically significant and F9. F6 is August 30. F9 is November 20. Okay.

18:16:14

Now let's go to the next slide. Here's what happens when you start applying actual reliable principles to his test.

F9, FDT says don't test it, that should drop out.

18:16:32

F1 and 2, when you take into account the structural break, in February, those aren't statistically significant. You're left with F6. He's got one date, Your Honor, one date out of nine that has a statistically significant result.

18:16:53

Now, you might say to me, "Jason, that's weird. That's August 30th. I thought you told me that Dr. Hallman tested August 30th and that Dr. Bajaj criticized Dr. Hallman and said, 'No, you missed the structural break in August. When you take into account the structural break in August, August 30th drops out.'"

And Dr. Feinstein agrees with that structural break. He agrees with the math.

18:17:07

How is it appearing on this chart again? I'll

tell you. Dr. Hallman, in conducting his regression, used an estimation period from before the class period.

Now, you might say, "Okay, Jason, what's a regression? Mr. Frank, what's a regression?"

18:17:25 In order to do these event studies, Your Honor, we try to pull out the effects of the market. In other words, we want to know what the firm-specific movement is. Companies tend, when the market goes up, the stock price of the company can sometimes go up. It tends to go up. When 18:17:44 their industry goes up, the stock price of a company in that industry goes up.

So economists like Dr. Feinstein and like Dr. Bajaj and like Dr. Hallman, they all agree on this, they run in a regression and they try to pull out any impacts 18:18:00 that could be occurring from the market, on the one hand, and from the specific industry on the other hand. Okay. And they try to use a control period to determine what is -- what is the standard relationship that we see.

August 30th, when you use Hallman's control 18:18:22 period, Dr. Bajaj is able to criticize it because he can ignore the structural break and it gets knocked out.

Dr. Feinstein chose a different estimation period, different control period. That is data mining.

In other words, Dr. Feinstein saw the results of 18:18:44 August 30th, didn't actually disagree with them, saw that

they didn't help his client and decided, you know what, I've got a different approach. If I use a different approach, maybe I can come up with new information.

And that's what happened.

18:19:02 So, Your Honor, I would submit to you, I have submitted to you that a Z-test does not establish market efficiency. Testing for -- it doesn't do it at all. It doesn't matter how many dates he came up with. He could come up with nine out of nine. It doesn't show that a market is efficient. That's not what a Z-test tests. Dr. Bajaj explained that. It just doesn't do it.

18:19:15

But what's worse, four out of nine certainly doesn't do it. But let me suggest to you that zero dates out of nine, that doesn't do it. This is a market that was in turmoil. This was a market that was in the midst of a financial crisis.

18:19:30

And the financial crisis, as you've heard testimony about and you rightly articulated earlier, was a crisis that arose out of the mortgage market. And the two GSEs, Fannie Mae and Freddie Mac, they are the largest participants in the U.S. mortgage market, and it's no surprise that their stock prices might behave in irrational ways, not in efficient ways.

18:19:51

And this really matters. Why does it matter? Because remember, in Basic, the court held that securities

18:20:09

fraud plaintiffs don't have to plead and prove reliance anymore. No more reliance requirement. Instead, we're going to presume, we're going to allow a presumption that they're relying upon the integrity of the market. If the market is efficient.

18:20:31

So if the market is efficient and someone tells an alleged lie, then that lie should impact the stock price. But if plaintiffs don't prove the market is efficient, there's no presumption of reliance.

18:20:49

And so, Your Honor, for those reasons, we believe that Dr. Feinstein has failed to establish market efficiency.

Now, let me talk -- feel free to interrupt me if I go over time, Your Honor.

18:21:01

THE COURT: Well, you're going over time, Mr. Frank. What more do you have to say?

MR. FRANK: Well, Your Honor, I'm willing to rely upon our briefs for the lack of price impact argument and for the failure to comply with Comcast arguments.

18:21:14

The fact of the matter is that the only thing Halliburton II did, it wasn't to change the market efficiency standard. I'm sure, you know, the court can reread it or maybe it developed an impression already. The fact of the matter is it just provided defendants with the opportunity to rebut market efficiency by showing a lack of

18:21:29

price impact to the specific statements.

THE COURT: And I think you capture those points in your opposition to the motion.

MR. FRANK: We do. We do.

THE COURT: Including the footnote on Halliburton.

MR. FRANK: But thank you for all your time, Your Honor. This motion for class certification, it should be denied for all the reasons that we've discussed and briefed, and we -- again, we really appreciate your time.

THE COURT: Certainly. You're welcome, sir.

Mr. Markovits, my estimate is what, 15 minutes?

MR. MARKOVITS: I will not take that, Your Honor. I too want to thank you for your incredible patience today. I am sorely tempted to use one of my favorite quotes from *My Cousin Vinny* and just sit down, but out of respect for Mr. Frank and the court, I'll just say I disagree with what he said.

(Laughter.)

MR. MARKOVITS: What Mr. Frank said was basically an attack on Cammer/Krogman. And Cammer/Krogman are supported by the Freeman case in the Sixth Circuit, the Lambert case is in the Sixth Circuit. I said before -- I forgot to mention the Willis versus Big Lots case, which is another one that adopts the Cammer/Krogman factor.

And I'm just going to talk about a couple of them.

Cammer factor 1, the trading volume. Anything over two percent, it creates a strong presumption that needs to be rebutted. They haven't rebutted it.

The trading on the New York Stock Exchange. 18:23:04 Dr. Bajaj agreed with me that large capitalization stocks that trade on major stock exchanges such as the New York Stock Exchange are generally presumed to be efficient unless there's evidence to the contrary. He had to agree with me because he had testified to that in another case.

18:23:20 So where's the evidence to the contrary? There's no rebuttal here, no rebuttal evidence. In other cases, Dr. Bajaj has presented rebuttal evidence, evidence of market inefficiency, he's done serial correlation tests, Y filter trading tests, put-call parity tests. He did not 18:23:40 do any of that in this case. There's been no rebuttal of the presumption of market efficiency in this case.

Again, as I said at the beginning, what we are going to see and what we have seen today is an emphasis and overemphasis on Cammer 5 as that's dispositive.

18:23:57 And defendants keep bringing up and Mr. Frank brought up the Freddie Mac/Kreysar case. That is the one case, Your Honor, that didn't include all of the Cammer factors had been met, but it's the one case where a judge, Judge Cedarbaum in New York, dealing with preferred stock of 18:24:13 Freddie, adopted Dr. Bajaj's argument that Cammer factor 5

was dispositive. That's since been overruled by the Second Circuit in the Waggoner case. That aspect -- that aspect of Freddie Mac/Kreysar is no longer good law in the Second Circuit.

18:24:38 Their challenge, again, to quote the Carpenters case, their challenge is too narrow. All these other factors are met.

And I think with that, Your Honor, unless you have any particular questions, I will rest.

18:24:55 THE COURT: Well, none that I'd like to voice. I think all of you have been incredibly helpful.

(Laughter.)

THE COURT: You've given me much to think about, and I will give everything that is left to be resolved much 18:25:08 thought. And I thank you for your preparedness, for your politeness not only to my staff and myself, but also to each other. Litigation doesn't always have to be contentious.

I did enjoy the testimony of the experts. So I know that each of you were put through paces that may not 18:25:27 have been as comfortable for you as you would have liked, but I thought it went off pretty well.

Unless there's something more, I have nothing more that I'll require of you today. Is there, on behalf of plaintiffs?

18:25:39 MR. MARKOVITS: No, Your Honor.

THE COURT: On behalf of the defense?

MR. FRANK: No, Your Honor. Thank you.

THE COURT: Thank you all. Please travel safely. And feel free to start to move about. The hearing is adjourned. I'll take some time to clean up my space.

18:25:48

MR. MARKOVITS: Thank you, Your Honor.

MR. FRANK: Thank you, Your Honor.

MR. McKAY: Thank you, Judge.

THE COURT: Certainly.

(Proceedings concluded at 6:25 p.m.)

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C E R T I F I C A T E

I certify that the foregoing is a correct transcript from the record of proceedings in the above-entitled matter.

/s/ Mary L. Uphold April 20, 2018
Mary L. Uphold, RDR, CRR Date

I N D E X

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